Electronic Cigarette Use and Chronic Respiratory Symptoms Among Adults in the United States

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INTRODUCTION

The use of electronic cigarettes (e-cigarettes) for vaporized nicotine delivery is increasing in the United States, especially among young adults. While marketed as a safer alternative to tobacco, little is known about their potential health impacts. We sought to determine the association of current e-cigarette use with chronic respiratory symptoms, and whether the association was modified by tobacco smoking status or age.

METHODS

We conducted a cross-sectional study of survey respondents from the 2017 Behavioral Risk Factor Surveillance System (BRFSS). We included individuals from 12 states who answered e-cigarette and respiratory symptom questions. Our primary exposure was current e-cigarette use (every day or some days). Our primary composite outcome was presence of daily cough, sputum production, or breathlessness. We estimated symptom prevalence ratios using log-binomial models with standard BRFSS survey weights. We stratified analyses by tobacco smoking status (current, recent former smokers (≤1 year quit), remote former smokers (>1 year quit), never smoker) after testing for interaction of both tobacco status and age group with e-cigarette use. We adjusted models for sex, obesity, age group, and presence of coronary heart disease, asthma, or chronic obstructive pulmonary disease.

RESULTS

Of 87,067 respondents, 2992 (4.6%) were current e-cigarette users and 38.4% had chronic respiratory symptoms. E-cigarette use was associated with higher symptom prevalence among never cigarette smokers (PR 1.28, 95% CI 1.11-1.49) and remote former smokers (PR 1.23, 95% CI 1.12-1.34) but not among current cigarette smokers (PR 1.03, 95% CI 0.98-1.09) or recent former smokers (PR 0.95, 95% CI 0.85-1.06). Among never cigarette smokers, the association was mostly driven by cough (PR 1.55, 95% CI 1.13-2.14). The association was similar across age groups, and in persons without diagnosed respiratory disease.

DISCUSSION

Our study suggests an association between e-cigarette use and respiratory symptoms among never cigarette smokers and remote former cigarette smokers. This association holds true for younger persons and those without a respiratory diagnosis who should otherwise be at low risk for respiratory symptoms. Our findings suggest future studies are needed to evaluate long term health impacts of e-cigarette use.

Too Blue to Fight the Flu? Assessing the relationship between poor mental health and influenza vaccine uptake in the American Indian/Native American U.S. population

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Background: The American Indian/Native Alaskan (AI/AN) population in the US suffers from disproportionately high rates of poor mental health and influenza hospitalizations, complications, and mortality. We conducted the first population-based study to assess the relationship between self-reported mental health and influenza vaccination within the AI/AN population using national survey data to better target resources to increase vaccination uptake in this high-risk group.

Methods: We analyzed data from the 2017 CDC Behavior Risk Factor Surveillance System (BRFFS). The primary exposure of interest was poor mental health, for which we used a proxy variable: the number of poor mental health days participants reported in the last month (≥14-days). The primary outcome of interest was whether participants received an influenza vaccine in the past 12 months. We examined whether the relationship differed based on four potential a priori effect modifiers of interest: age, sex, having a primary care provider, and a history of depressive disorders.

Results: A total of 8,497 individuals self-identified as AI/AN, of whom 16.0% reported ≥14 poor mental health days in the last 30 days. Overall, 33.1% of those who reported ≥14 poor mental health days reported receiving an influenza vaccination compared to 37.3% among those reporting fewer poor mental health days, corresponding to a 11% lower prevalence of influenza vaccination compared to those with fewer poor mental health days (PR 0.89; 95% CI 0.73 – 1.07). Females reported higher prevalence of vaccination when compared to males (PR 1.04; 95% CI 0.51 -2.11). Self-report of poor mental health days did not differ substantially by sex or having a primary care provider.

Discussion: We did not find statistically significant evidence of an association between poor mental health days and influenza vaccination status, nor for interaction by the a priori co-variates tested. These findings suggest that despite mental health issues disproportionately affecting AI/AN when compared to the general population, there are other barriers to vaccine uptake that were not included in this analysis.

Association Between Former Asthma and Risk Factors of Cardiovascular Disease in a National Sample

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Introduction: Asthma is a common cause of morbidity, affecting over 6 million children and 26 million adults in the United States. While asthma is associated with obesity and metabolic syndrome in adults, it is unclear whether these same associations exist in adults with a history of resolved childhood asthma (former asthma). This study evaluated the risk of obesity, hypertension, hyperlipidemia and borderline or prediabetes among young adults with former asthma.

Methods: We conducted a cross-sectional analysis using the 2017 CDC Behavioral Risk Factor Surveillance System aged 18 to 39 years. The prevalence of obesity, hypertension, hyperlipidemia and borderline or prediabetes was compared between young adults with former asthma and those who have never been diagnosed with asthma.

Results: A total of 89,622 young adults were included for analysis. Overall prevalence of obesity was 27% in young adults with former asthma and 24% in those never diagnosed with asthma. After adjusting for age, sex, race/ethnicity, education level and smoking status, the prevalence of obesity was 17% higher in the group with former asthma, compared to the group with no history of asthma (PR1.17, 95% CI 1.08-1.26). The former asthma group also had a 30% higher adjusted prevalence of hypertension (PR 1.30, 95% CI 1.16-1.45) and 16% higher adjusted prevalence of hypercholesterolemia (PR 1.16, 95% CI 1.02-1.32). The prevalence of borderline or prediabetes did not differ between the former asthma group and those without a history of asthma (PR 1.21, 95% CI 0.96-1.52).

Discussion: Adults with a history of resolved asthma continue to have higher rates of obesity, hypertension and hypercholesterolemia compared to adults that have never had asthma. These individuals represent a previously unrecognized group with higher risk of cardiovascular disease, who may benefit from targeted interventions to reduce this risk. Further investigations are required to determine mechanisms for the associations and interventions that may be of benefit to these populations.

Contraceptive use Among Women Aged 18-44 Years with Medical Contraindications to Estrogen in the United States

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Introduction
Despite efforts to increase access to effective contraception, unintended pregnancies remain common in the United States. Medical contraindications to estrogen such as hypertension and heart disease limit women's contraceptive options and may be a barrier to pregnancy prevention. This study assessed the effect of medical contraindications to estrogen on contraceptive use and examined the role of financial barriers in this association.

Methods
This study analyzed women ages 18-44 at risk of unintended pregnancy participating in the 2017 Behavioral Risk Factor Surveillance System Preconception Health/Family Planning module. Medical contraindications to estrogen were ascertained through self-report of hypertension, coronary heart disease, stroke, myocardial infarction, or current smoking among women older than 35 years. Women reporting current use of contraceptive methods with a yearly efficacy of less than 88%, such as condoms and withdrawal, were considered users of less effective methods. We identified individuals with financial barriers to care based on self-report of not being able to see a medical provider in the past 12 months due to cost. Using population survey weights, we estimated a prevalence ratio adjusted for age, race, income, and presence of financial barriers to compare the proportion of women using less effective contraception among those with medical contraindications to estrogen versus those without contraindications. Presence of a financial barrier to care was explored as an effect modifier in both models.

Results
Overall this study included 32,321 women, of which 16% had one or more medical contraindications to estrogen. The most commonly reported contraindication was hypertension (population prevalence 12%). Among women with one or more contraindications, 39% were using a less effective method of contraception compared to 41% of those without a contraindication (adjusted prevalence ratio: 0.90 [95% CI 0.80-1.02]). There was no evidence of effect modification based on financial barriers to care.

Conclusions
Women with contraindications to estrogen are no less likely to use highly effective contraceptive methods than those without contraindications. Health literacy and healthcare access may be greater among women who are aware of their medical contraindications to estrogen, and this may increase their ability to obtain effective methods.

Perceived Neighborhood Safety and Hypertension; 2017 Behavioral Risk Factors Surveillance System Data

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Introduction

Hypertension contributes to several adverse health conditions. Many factors leading to an increased risk of hypertension are related to stress that can arise from socio-environmental demands, including perceiving one's neighborhood as unsafe, which has been associated with increases in psychologically stimulated stress. The purpose of this study was to explore association between perception of neighborhood safety and hypertension and assess how it varies across age, sex, and race/ethnicity.

Methods

Using 2017 Behavioral Risk Factor Surveillance System (BRFSS) data, we conducted a cross-sectional study with 86,517 individuals from 17 states that completed the core modules as well as the optional "Social Determinants of Health" module. Participants self-reported their perception of neighborhood safety and their hypertension diagnosis history, if any. We used calculated weights from Centers for Disease Control and Prevention to account for survey design and estimated prevalence ratios using log binomial generalized linear regression models. The purpose of this study was to explore and describe the burden of hypertension due to perception of neighborhood safety, and not to assess a causal relationship. Therefore, we did not include confounders in our analyses. We additionally assessed for differences in prevalence ratios across age, sex, and race/ethnicity.

Results

Prevalence of hypertension was greater among those who perceived their neighborhood as unsafe (38.3% vs. 33.7% in safe neighborhoods); prevalence ratio: 1.14 (95% CI: 1.04, 1.24). There was no meaningful difference in prevalence ratios when stratified across age, sex, and race/ethnicity.

Discussion

Those with unsafe neighborhood perception had a significantly higher prevalence of self-reported hypertension. Contrary to previous studies, there was no meaningful difference detected across the interaction terms of age, sex, and race/ethnicity. This study provides a basis for further descriptive and observational research studies on the association of perceived neighborhood safety and hypertension.

Poor mental health as a barrier to flu vaccination in pregnancy: a Behavior Risk Factor Surveillance System 2011-2017 analysis

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Introduction: Pregnant women who become infected with seasonal influenza (flu) have a higher risk of complications and poor mental health might reduce the likelihood of receiving vaccination against the flu. The CDC recommends that pregnant women receive the flu vaccine. The purpose of this study was to determine if poor mental health is associated with reduced flu vaccination among pregnant women and determine if this relationship is modified by age or race.

Methods: The analysis used Behavioral Risk Factor Surveillance System (BRFSS) data from 2011-2017 regarding self-reported days of poor mental health and flu vaccination in the past year among women who reported current pregnancy. We considered healthcare coverage and annual income to be confounders. We calculated crude and adjusted prevalence ratios and 95% confidence intervals for the relationship between poor mental health days and flu vaccination using survey-weighted log-binomial regression. We assessed trends of missing data across mental health status. To assess for interaction by age and race, we performed regression for each category and compared the prevalence ratios using a test of heterogeneity. Among the 17,668 pregnant individuals, 10% reported ≥14 days of poor mental health in the last 30 days.

Results: Among pregnant women, flu vaccination prevalence was lower among those with ≥14 poor mental health days compared to those with <14 poor mental health days (35.1% versus 42.4%). The crude prevalence ratio of flu vaccination was 0.75 (95% CI: 0.66 - 0.85). After adjusting for health care coverage and annual income, flu vaccination was 0.85 times as likely among pregnant women who reported ≥14 days of poor mental health (95% CI: 0.75 - 0.98) relative to pregnant women reporting <14 days of poor mental health. We found no evidence of effect modification by age or by race.

Discussion: Our analysis found that pregnant women with ≥14 days of poor mental health in the last 30 days were less likely to have received a flu vaccination, suggesting that this population may be an overlooked at-risk population for flu vaccine uptake. Future research should focus on reducing barriers to flu vaccination among this population.

Association Between Physical Activity and Mental Health in U.S. Adults in 2015 and 2017: A Cross-Sectional Study

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Introduction: Twenty percent of U.S. adults have a mental health disorder. Physical activity's benefit on mental health has been well described. However, little is known about how much physical activity is necessary to provide a mental health benefit, especially among groups at high risk for poor mental health, such as obese individuals. The objective of this study was to evaluate the association between amount of physical activity and reported mental health.

Methods: We used the Behavior Risk Factor Surveillance System survey's physical activity module for the years 2015 and 2017. Participants were included if they completed questions from the physical activity module to calculate minutes of moderate physical activity (or vigorous equivalent) per week categorized as: 0, 1-29, 30-59, 60-150, or 150+ minutes. The outcome was number of poor mental health days in the past month (0-13 days or ≥14 days). Poisson models were used to estimate prevalence ratios (PR) and 95% confidence intervals (CI). Age, gender, race, education, and history of chronic disease were included as covariates. We evaluated whether associations differed for obese (body mass index [BMI] $\geq$ 30 kg/m^2) and non-obese (BMI<30 kg/m^2) adults.

Results: Data from 783,364 adults were included. More non-obese adults reported high levels (150+ minutes) of physical activity than obese adults (non-obese: 71%, obese: 24%). Fewer non-obese adults reported no activity than obese adults (non-obese: 57%, obese: 35%). Among non-obese adults, the prevalence of $\geq$14 mental health was lower with increasing amounts of weekly physical activity, when compared to those who reported no physical activity (PR [95% CI]): 1-29 minutes: 0.91 [95% CI: 0.82-1.00]; 30-59 minutes: 0.74 [95% CI: 0.67-0.81]; 60-149 minutes: 0.66 [95% CI: 0.62-0.70];150+ minutes: 0.63 [95% CI: 0.61-0.66]. Associations were similar among obese adults.

Conclusion: Physical activity amount was inversely associated with $\geq$14 poor mental health days per month. This relationship was similar among obese and non-obese adults. Future research should focus on the development of randomized trials to further investigate the amount of physical activity necessary to provide a mental health benefit, especially among individuals with risk factors for poor mental health.

A multi-state evaluation of mental health, firearm availability, and storage practices

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Introduction: Firearm availability and storage practices are modifiable suicide risk factors. Little is known about the association between firearm availability, storage practices, and mental health in the context of state-level legislation. The objectives of this study were to determine the associations between poor mental health and household firearm availability and storage practices and examine whether the associations were modified by the strength of state-level firearm regulations.

Methods: Participants who answered the mental health and firearm modules in the 2016-2017 Behavioral Risk Factor Surveillance System from 8 states were included (n=63,949). Exposures were: self-reported (1) 1-13 and ≥14 poor mental health days (vs. zero) and (2) diagnosis of depression. Outcomes were: self-reported (1) presence of a household firearm, (2) firearm kept loaded, and (3) firearm kept loaded and unlocked. We used multivariable log binomial and Poisson regression analyses to calculate prevalence ratios (PR) and 95% confidence intervals. All models were adjusted for: age, sex, race/ethnicity, education level, employment status, marital status, veteran status, health insurance status, and presence of children in the household. Giffords Law Center grade (A-C or F) was evaluated as an effect modifier to assess the impact of state-level firearm regulations.

Results: There was no association between poor mental health days or depression diagnosis and presence of firearm in the household. Among those with a firearm in the household, respondents with 1-13 poor mental health days, but not ≥14 days, were less likely than those with 0 poor mental health days to keep a firearm loaded (aPR 0.79, 95% CI 0.67-0.92). There were otherwise no significant differences in storage practices by mental health status. There was no evidence of effect modification by Giffords Grade.

Discussion: The lack of difference in firearm availability or storage practices in those who report depression suggests the need to evaluate the efficacy of current medical screening and counseling practices. Likewise, the similarity in availability and access between states highlights an opportunity to evaluate policy relating to mental health and firearms. Despite the limitations associated with using survey data, this study provides a model for further analysis and impetus for ongoing national evaluation.

Out for Good: Unpacking Tobacco Use Among Sexual and Gender Identities

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Introduction: Prior research shows sexual orientation and gender identity (SOGI) minorities exhibit greater prevalence of tobacco use than non-minorities. However limited research exists on SOGI minority subpopulations (e.g. lesbian/gay, bisexual, transgender, gender non-conforming individuals). This cross-sectional study assesses prevalence of cigarette and electronic cigarette (e-cigarette) use in SOGI minorities compared to non-minorities, and investigates variations in these associations across education levels and race, as well as among different sexual and gender identity groups.

Methods: Data were obtained from 31 states that implemented the Sexual Orientation and Gender Identity Modules of the Behavioral Risk Factor Surveillance System in 2016 and 2017. Prevalence ratios for current cigarette and e-cigarette use, adjusted for age and geographic region, were calculated using log-binomial regression and compared SOGI minorities to non-minorities. Prevalence ratios stratified by education, gender, race, and specific sexual and gender identity were also reported.

Results: SOGI minorities were more likely to report current cigarette (adjusted PR=1.42; 95% CI: 1.34, 1.51) and e-cigarette use (adjusted PR=1.51; 95% CI: 1.36, 1.67) compared to non-minority counterparts. These associations were more pronounced among SOGI minority women, those with higher levels of education, and those who are Black or Hispanic. Compared to straight respondents, both lesbian/gay and bisexual respondents exhibit higher cigarette and e-cigarette use; this association was not observed among those who responded “other” as their sexual orientation. Gender identity minorities reported greater e-cigarette use than cisgender respondents; a less conclusive association was noted with respect to current cigarette use.

Discussion: The results of this study are consistent with other literature, having identified more pronounced tobacco use in SOGI minorities. These results highlight the need for tobacco smoking interventions targeted at SOGI minorities who are women, have higher education, are Black or Hispanic, or identify as lesbian/gay or bisexual.

A cross-sectional study of the association between education and non-financial delay in healthcare access among low-income respondents to the Behavioral Risk Factor Surveillance System 2016- 2017.

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INTRODUCTION: Low-income populations in the United States (U.S.) experience a greater burden of systemic and structural barriers that impact their health seeking behaviors and ability to access the healthcare system. It is widely demonstrated that education is a critical social determinant of health; however, education has not been examined in relation to delay in accessing healthcare for non-financial reasons in the U.S.

METHODS: This cross-sectional study used data from the 2016 and 2017 Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System to measure the association between education and self-reported non-financial delay in healthcare access among low-income respondents (defined as those earning less than 200% of the 2017 U.S. Census Bureau's national Poverty Threshold). In addition we assessed racial differences in this association. Using log-Poisson regression models with adjustment for age, sex, general health status, and health insurance status, we estimated the adjusted prevalence (aPR) of non-financial delay in healthcare access.

RESULTS: We included 20,450 low-income respondents in our analysis. Respondents who did not graduate high school (aPR: 1.03, 95% CI: 0.92, 1.15) and college graduates (aPR: 1.06, 95% CI: 0.94, 1.21) had a similar prevalence of non-financial delay in healthcare access compared to respondents who graduated high school or received their General Educational Development (GED). In the race-stratified analysis, White respondents who were college graduates (aPR: 1.04, 95% CI: 0.92, 1.24) and White non-high school graduates (aPR: 1.07, 95% CI: 0.92, 1.24) had a similar prevalence of non-financial delay in healthcare access compared to White high school graduates. Black respondents who did not graduate high school had a 26% higher prevalence of non-financial delay in healthcare access than Black respondents who graduated high school or received a GED (aPR: 1.26, 95% CI: 1.01, 1.56). Black respondents who graduated college had slightly lower (though non-significant) prevalence of non-financial delay in healthcare access relative to Black respondents who graduated high school or received a GED (aPR: 0.98, 95% CI: 0.71, 1.34).

CONCLUSIONS: These findings suggest that overall education was not associated with non-financial delay in healthcare except among Black respondents who had less than a high school education/GED. Understanding the extent to which educational disparities and race impact healthcare access among low-income individuals in the U.S. is crucial to identifying high-risk groups and inform potential systemic and structural interventions to help mitigate non-financial barriers to access.

Caregiving during emerging adulthood and its impact on frequent mental distress, smoking, and drinking behaviors: An analysis using the Behavioral Risk Factor Surveillance System, 2015 – 2017

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Introduction: Emerging adults (adults aged 18 – 25) comprise a substantial proportion of caregivers in the U.S. They may be more socially and economically vulnerable than older adults, and thus differentially affected by the experience of caregiving. Limited evidence suggests emerging adult caregivers may report more frequent mental distress (FMD) than older caregivers. Further, while most research compares caregiver outcomes to general non-caregivers, persons who are not currently caregivers but expect to be caregivers may represent a more exchangeable comparison group and improve the control of unmeasured confounders. The current study examines the association between caregiving and behavioral health outcomes among emerging adults when compared to both expectant caregivers and non-caregivers.

Methods: Data on emerging adults (aged 18 - 25) were obtained from the 2015 – 2017 Behavioral Risk Factor Surveillance System. Behavioral health outcomes included FMD (> 14 days of poor mental health in the past 30 days), binge drinking, heavy drinking, and current cigarette and e-cigarette use. Exposure was categorized as persons who: (1) were current caregivers (n = 3,087), (2) expected to become caregivers within the next 2 years (n = 2,303), or (3) were neither caregivers nor expected to become caregivers (n = 12,216). Adjusted prevalence ratios (aPR) were calculated using Poisson regression with robust standard errors. All models were adjusted for income, gender, and employment.

Results: Caregiving was associated with higher prevalence of FMD when compared to both expectant caregivers (aPR = 1.62; 95% CI: 1.25, 2.10) and non-caregivers (aPR = 1.44; 95% CI: 1.19, 1.75), and a higher prevalence of current cigarette smoking when compared to non-caregivers (aPR = 1.40; 95% CI: 1.19, 1.65). Caregiving was not associated with differences in the prevalence of drinking behaviors and e-cigarette smoking.

Discussion: Our results indicate that caregiving is associated with negative behavioral health among emerging adults, which aligns with the literature concerning mental health outcomes of caregivers. Prevalence ratios of FMD were higher using expectant caregivers as the reference group, suggesting that studies comparing caregivers to general non-caregivers may underestimate the impact of caregiving on mental health.

Clearing the Haze: Budding Alternatives to High Healthcare Costs

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Background
Many adults face financial barriers to accessing healthcare in the United States (US). Alternative treatments such as marijuana are commonly used, but little is known about the impact of costs on treatment-seeking behaviors, particularly with regard to marijuana use. We sought to evaluate the association between forgoing healthcare due to cost and marijuana use for medical purposes (MMU).

Methods
We conducted a cross-sectional study using the 2017 Behavioral Risk Factor Surveillance System among states that completed the Marijuana Module (N=13). We applied CDC-calculated survey weighting to all analyses to ensure representativeness of the sample. Primary analyses included states/territories that had legalized marijuana for medical or recreational use by 2017 (N=7). We used quasi-Poisson regression to estimate prevalence ratios for MMU among those who experienced cost barriers to care, adjusting for potential confounders. We also stratified analyses by age group and by state/territory marijuana legalization status to assess potential effect modification. Finally, we conducted a sensitivity analysis with states that had not yet legalized marijuana use for any purpose in 2017.

Results
The primary analyses included 40,756 adults. Overall, 11.3% of respondents were unable to see a doctor for financial reasons in the previous year, of whom 8.8% used marijuana for medical purposes in the previous month. MMU prevalence was 86% higher among those who experienced cost barriers (aPR 1.86, 95% CI 1.47-2.36). The association was strongest among middle-aged adults (30-49 years) (aPR 2.50, 95% CI 1.75-3.55) and within states that had not legalized marijuana use (aPR 2.37, 95% CI 1.77-3.18). Incidentally, the marijuana legal status in these states was almost perfectly correlated with Medicaid expansion.

Discussion
Our findings suggest a possible association between delayed medical care due to cost and uptake of alternative treatments such as marijuana. Further research should explore the specific reasons for self-medication among US adults; build on our finding that residents in states without expanded Medicaid may be more likely to self-medicate with marijuana, despite its illegality, as an alternative to cost-prohibitive healthcare; and elucidate potential effects of MMU.

Routine Health Care Utilization Among U.S. Adults Who Use Marijuana

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Introduction: Marijuana use is more common among U.S. adults today than anytime in the past fifteen years. While the perceived risk of harm from marijuana use has decreased in the past fifteen years, the health consequences of excessive marijuana use are well established. However, it is unclear whether occasional and frequent marijuana users utilize primary care with the same frequency as non-users. This may be an appropriate setting for a brief intervention to identify cannabis use disorders and reduce excessive marijuana use for those not otherwise seeking treatment.

Methods: We conducted a cross-sectional study of the relationship between marijuana use in the last 30 days, categorized as no use, occasional use (1-13 days) and frequent use (14+ days), and a check-up visit within the last year using 2016 Behavioral Risk Factor Surveillance Survey (BRFSS) data. Twelve states responded to the optional marijuana module and a total of 113,764 individuals were included in the study. Survey weights were applied to account for the complex design, and logistic poisson regression was used to estimate prevalence ratios. Prevalence ratios were adjusted for sociodemographic factors, and effect modification by mental health and state marijuana legality was assessed.

Results: The crude prevalence of a recent routine care visit was 72% among adults reporting no marijuana use, 61% among occasional users, and 56% among frequent users. After adjusting for age, sex, education, and health insurance, compared to non-users the prevalence ratio was 0.94 (95% CI: 0.87,1.02) for occasional users and 0.89 (95% CI: 0.82, 0.95) for frequent users. The association between marijuana use and a recent check-up did not differ by mental health or legality.

Discussion: There is a slight trend of lower recent check-up utilization among those who reported marijuana use compared to those who did not. While frequent users were slightly less likely to utilize routine care than non-users, the majority of frequent users interact with primary care every year, presenting a potential opportunity for screening for cannabis use disorder and a brief intervention.

LGBTQ identity, social support, and mental health: Analysis of the Behavioral Risk Factor Surveillance System (2014 - 2017)

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Introduction
Sexual and gender minorities are disproportionately affected by poor mental health. Social support has been associated with reduced adverse mental health outcomes. We assessed whether social support differs by sexual orientation and gender identity and if these factors modify the relationship between social support and poor mental health.

Methods
This study utilized data from the Behavioral Risk Factor Surveillance System (2014 – 2017). Sexual orientation included straight, gay/lesbian, bisexual, and other/don't know. Gender identity included cisgender or transgender. Respondents who reported receiving social support "sometimes", "rarely", "never", or "don't know/not sure" were classified as having low social support. Respondents reporting ≥ 14 poor mental health days in the past month were classified as having poor mental health. Poisson regression models were fit to assess the association between social support and sexual orientation stratified by gender identity and between social support and mental health stratified by sexual orientation and gender identity.

Results
Of 80,586 respondents, 4,264 (5.5%) were sexual minorities, while 365 (0.5%) were transgender. Prevalence of low social support for straight cisgender, straight transgender, cisgender sexual minority, and transgender sexual minority individuals was 18%, 22%, 30%, and 66%, respectively. Compared to straight cisgender individuals, cisgender sexual minorities were 1.5 times more likely to report low social support [95%CI: 1.4-1.7] while transgender sexual minorities were 2.9 times more likely to report low social support [95%CI: 2.2-3.8]. Among straight cisgender individuals, those who reported low social support were 3.2 times more likely to have poor mental health compared to individuals with high social support [95%CI: 2.9-3.4]. Among cisgender sexual minorities, those who reported low social support were 2.4 times more likely to have poor mental health compared to individuals with high social support [95%CI: 1.9-3.1]. Similar associations were reported among transgender individuals.

Discussion
Sexual and gender minorities experienced lower social support. The association between low social support and poor mental health was weaker among sexual and gender minorities, suggesting that social support may not be the crucial mediating factor in the etiology of poor mental health in this population. Future research should assess how various sources of social support impact mental health.

Association of arthritis and anti-hypertensive medication use among individuals with hypertension: a cross-sectional analysis

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Introduction:
Arthritis is common among US adults and cardiovascular (CV) disease risk is elevated in some subtypes. Hypertension is a major, treatable CV risk factor that has not been well-studied in individuals with arthritis. We used survey data from the 2017 Behavioral Risk Factor Surveillance System to examine the association between arthritis and anti-hypertensive medication (AHM) use among those with hypertension, and assessed whether this relationship differed by age or composite CV comorbidity.

Methods:
We included 179,503 adults with available information on self-reported hypertension, arthritis status, and AHM use. We weighted the data to account for the complex sampling design and non-response bias. Using generalized linear models, we estimated unadjusted and adjusted prevalence ratios (PR) and calculated 95% confidence intervals (CI) comparing AHM use between those with and without arthritis, while accounting for potential confounders identified a priori.

Results:
Overall, 42.7% reported a diagnosis of arthritis. Compared to those without arthritis, they were older, predominantly female, and reported a lower income status and more comorbidities. Prevalence of AHM use was 85.1% among those with arthritis and 69.2% in those without. The AHM use prevalence for the age groups of 18-44, 45-64, and ≥65 years was 37.9%, 79.7%, and 92.0%, respectively. The association between arthritis diagnosis and AHM use was strongest in the youngest age group. After adjustment for the confounders of sex, race, inability to afford medications, and CV comorbidity, the PR for AHM use comparing arthritis versus no arthritis was 1.39 (95% CI 1.28-1.51), 1.07 (95% CI 1.05-1.09), and 1.02 (95% CI 1.01-1.03) for the age categories 18-44 years, 45-64 years, and ≥65 years, respectively.

Discussion:
After adjustment for confounders, among individuals with hypertension, those with arthritis had a significantly higher prevalence of AHM use compared to those without arthritis. The PR was highest among those <45 years old compared to older age groups, partly driven by the lower overall prevalence of AHM use among younger adults. Recognizing the prevalence of AHM use among those with arthritis who are at increased risk of CV disease is of particular importance for targeting preventative interventions.

Salaries count: education and income are associated with using fast food calorie menu labels in West Virginia and Mississippi adults, BRFSS 2016

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Introduction: Menu labels aim to help consumers make informed decisions. Evidence, primarily from urban areas, suggests high socioeconomic status consumers use menu labels more often, potentially reinforcing socioeconomic obesity disparities. We assessed whether education and income were associated with noticing and using menu labels in two rural states with high burdens of poverty and obesity.

Methods: We conducted a cross-sectional analysis using 2016 Behavioral Risk Factor Surveillance System data including 7,939 adults from West Virginia and Mississippi. Exposures were indicators of socioeconomic status: highest education level and annual household income. Outcomes were 1) noticing and 2) using menu labels. We used a generalized linear model with Poisson distribution and log link to estimate associations between noticing and using menu labels and education/income. Models used survey weights and were mutually adjusted for education and income, as well as age, sex, race/ethnicity, and BMI.

Results: Overall, 88% of participants reported noticing and 56% reported using menu labels. Compared to individuals with less than a high school education, college graduates were 13% more likely to report noticing (Prevalence Ratio (PR): 1.13, 95% CI: 1.06-1.19) and 18% more likely to report using (PR: 1.18, 95% CI: 1.07-1.30). Associations with intermediate education levels were not statistically significant. Compared to individuals in the lowest income category, those with $50,000-74,999 were 7% (PR: 1.07, 95% CI: 1.02-1.11) more likely to report noticing, though individuals with $25,000-$49,999 (PR: 1.04, 95% CI: 1.00-1.08) and ≥ $75,000 (PR: 1.04, 95% CI: 1.00-1.08) were no more likely to report noticing. Compared to the lowest income group, those with ≥$75,000 were 11% (PR: 1.11, 95% CI: 1.02-1.21) more likely to report using, while those with $25,000-$49,999 (PR: 1.04, 95% CI: 0.97-1.13) and $50,000-$74,999 (PR: 1.05, 95% CI: 0.95-1.16) were no more likely to report using.

Discussion: High education and income were associated with noticing and using menu labels. While labeling requirements aim to encourage healthy diets, this study highlights socioeconomic disparities in their use, raising concerns that menu labeling may not equitably reach high risk populations for obesity. More research is necessary to understand mechanisms driving these disparities and inform future policies.