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journal homepage: www.elsevier.com/puhe

Original Research

Examining the association between adverse childhood experiences and smoking-exacerbated illnesses

E. Crouch [a,*], E. Radcliff [a], M. Strompolis [b], A. Wilson [b]

[a] South Carolina Rural Health Research Center, Arnold School of Public Health, University of South Carolina, 220 Stoneridge Dr, Suite 204, Columbia, SC 29210, USA
[b] Children's Trust of South Carolina, 1330 Lady St, #310, Columbia, SC 29201, USA

ARTICLE INFO

Article history:
Received 3 July 2017
Received in revised form
10 January 2018
Accepted 22 January 2018

Keywords:
Adverse childhood experiences
Adult smoking
Smoking-exacerbated illness

ABSTRACT

Objectives: Adults who smoke increase their likelihood of death from smoking-exacerbated illnesses. The presence of illnesses exacerbated by smoking can be a powerful incentive to quit smoking. However, having a smoking-exacerbated illness does not stop all patients from smoking. Understanding that smoking may be a coping mechanism for stress, this study examined the association between the experiences of adverse events in childhood with continued smoking in adulthood among individuals and a smoking-exacerbated illness.

Study design: This retrospective observational study used 2014–2015 data from the South Carolina Behavioral Risk Factor Surveillance System survey.

Methods: We used multivariable logistic regression to examine the impact of adverse childhood experience (ACE) exposure on current smoking status.

Results: A total of 6321 respondents reported having a smoking-exacerbated illness. The most frequently reported categories of smoking-exacerbated illnesses were current asthma (63.9%), previous asthma (13.0%), and diabetes (12.3%). Overall, 62.4% of respondents had at least one ACE, with 20.3% of respondents having four or more ACEs. Respondents with one to three ACEs (adjusted odds ratio [aOR] 1.38; 95% confidence interval [CI] 1.37–1.40) and four or more ACEs (aOR 2.89; CI 2.86–2.92) were both significantly more likely to smoke than respondents with no ACEs, even in the presence of illnesses exacerbated by smoking.

Conclusions: Results suggest that ACE exposure may influence risky health behaviors in adulthood, such as continued smoking even in the presence of illnesses that are exacerbated by smoking. Given that smoking has been found to be a coping mechanism for adversity, anti-smoking efforts might benefit from designing interventions and treatment plans that address ACE exposure.

* *Corresponding author*. Tel.: +1 803 576 6055; fax: +1 803 251 6399.
E-mail address: crouchel@mailbox.sc.edu (E. Crouch).

https://doi.org/10.1016/j.puhe.2018.01.021

Introduction

Those who smoke regularly throughout adulthood increase their likelihood of death from smoking-exacerbated illnesses, with 20% of regular smokers dying from smoking-exacerbated illnesses.[1] The presence of smoking-exacerbated illnesses, such as heart disease, lung disease, and diabetes, as well as symptoms of the illnesses such as asthma and shortness of breath, can be powerful incentives to quit smoking.[2–4] However, smoking-exacerbated symptoms and illnesses do not stop all patients from smoking, with no differences found in rates of cessation between those with and without cardiovascular disease.[5]

One of the strongest predictors of smoking cessation is the level of nicotine dependence and the age of the smoker.[6] Demographic factors in persistent smokers, defined as those who may never quit, have previously been identified: younger, less educated, and lower income individuals are less likely to quit smoking.[7–12] Socio-economic status is associated with both smoking initiation and cessation.[13–16] Higher socio-economic status has been found to increase the likelihood of smoking cessation, with lower socio-economic status associated with persistent smoking.[14] Previous research has generated conflicting results on the role of gender in smoking cessation, with some studies finding gender differences and others finding none.[17–20] More recent literature using population data has demonstrated that females younger than 40 years are more likely to quit smoking than male cohorts, while in those older than 40 years, men are more likely to quit smoking than women.[21]

Research suggests that smoking is known to be a coping mechanism for stress.[22–24] Exposure to adverse childhood experiences (ACEs) is associated with both the initiation and persistence of smoking.[25–27] ACEs are specific negative or traumatic events that occur in a child's life before the age of 18 years.[28] ACEs include multiple types of child maltreatment and household dysfunction (Table 1). The effects of ACEs have been shown to have negative long-term health outcomes for both physical and mental health.[28–40] Previous literature has documented the relationship between ACEs and risky behaviors such as smoking and excessive alcohol use.[41] However, little work has examined the influence of ACE exposure on a specific risky health behavior: smoking status among adults with illnesses or conditions that may be exacerbated by smoking.

Using data from the South Carolina (SC) Behavioral Risk Factor Surveillance System (BRFSS)/ACE study, we examined the association between current smoking status and ACE exposure among individuals with smoking-exacerbated illnesses. We hypothesized that individuals with smoking-exacerbated illnesses who experienced multiple ACEs are more likely to engage in smoking than individuals who have not experienced ACEs.

Methods

Data source

This retrospective observational study used 2014–2015 data from the SC BRFSS survey ($n = 18{,}127$). Of the 18,127 SC BRFSS respondents, 6321 reported having a smoking-exacerbated illness. The 6321 respondents with a self-reported smoking-exacerbated illness became our analytic sample. Compared with the national average in the United States, SC has higher rates of minority residents, rural residents, and fewer residents with a bachelor's degree; these demographic characteristics are all associated with an increased likelihood of ACEs, making this a unique data set for analysis and examination.[28,42]

Table 1 – Adverse childhood experience questions included in the South Carolina Behavioral Risk Factor Surveillance System, 2014–2015.

Childhood experience	Survey question(s)
Household mental illness	1. Did you live with anyone who was depressed, mentally ill, or suicidal?
Household substance use	2. Did you live with anyone who was a problem drinker or alcoholic? 3. Did you live with anyone who used illegal street drugs or who abused medications?
Household incarceration	4. Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?
Parental separation/divorce	5. Were your parents separated or divorced?
Witnessing household violence	6. Did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?
Physical abuse	7. Before age 18, did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?
Emotional abuse	8. Did a parent or adult in your home ever swear at you, insult you, or put you down?
Sexual abuse	9. Did anyone at least five years older than you or an adult ever touch you sexually? 10. Did anyone at least five years older than you or an adult try to make you touch them sexually? 11. Did anyone at least five years older than you or an adult force you to have sex?

The BRFSS survey included an additional 11-question ACE module that was designed and adapted from the original Kaiser Permanente-Centers for Disease Control and Prevention (CDC) study and supported by the Children's Trust of South Carolina and the South Carolina Department of Health and Environmental Control. The BRFSS survey, overseen nationally by the CDC, is conducted daily and uses random digit dialing of landlines and cell phones to reach non-institutionalized adults aged 18 years or older. This research was deemed exempt by the University of South Carolina's Institutional Review Board under the protocol number 00058520.

Variable construction

Our primary outcome of interest was current smoking status. A survey respondent was designated as a current smoker if he/she reported smoking at least 100 cigarettes in his/her lifetime and if he/she smoked cigarettes now. This definition has been used in previous research to define current smoking status.[25,43–45]