



Association of Electronic Cigarette Use with Self-Reported Cognitive Deficits in Youth

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Abstract

Introduction: Electronic cigarette use (vaping) has become increasingly popular among youth, which makes it important to understand the possible health effects of vaping on youth. The aim of this study is to determine the cross-sectional association between vaping and self-reported cognitive deficits in youth.

Method: The 2018 National Youth Tobacco Survey (NYTS) data with 20,189 youth were used for analysis. All included youth answered whether they have serious difficulty concentrating, remembering, or making decisions (referred as self-reported cognitive deficits), and stated their vaping and smoking status. Multivariable weighted logistics regression models were used to examine the association of electronic cigarette use in youth with the risk of cognitive deficits with consideration of the complex sampling design.

Results: While both dual users of electronic cigarettes and cigarettes (aOR = 1.86; 95% CI = 1.35 to 2.54) and ever smokers (aOR = 1.45; 95% CI = 1.13 to 1.88) had a significantly higher association with self-reported cognitive deficits than never users, ever vapers who used electronic cigarettes even once or twice (aOR = 1.36; 95% CI = 1.06 to 1.74) had a significantly higher association with self-reported cognitive deficits compared to never users in youth. Starting using e-cigarettes in middle school had a significantly higher association with self-reported cognitive deficits compared to starting e-cigarettes in high school (aOR = 1.58; 95% CI = 1.10 to 2.26). Male students who ever vaped had a higher association with self-reported cognitive deficits than female students who ever vaped, with aOR = 1.91 (95% CI = 1.40 to 2.60).

Discussion: Vaping is significantly associated with self-reported cognitive deficits in youth. The younger an adolescent starts vaping, the higher the association with self-reported cognitive deficits. These results provide an evidence on the possible health effects of vaping on the cognitive functions of youth, which further stresses the importance of quitting smoking and vaping.

Introduction

- ❖ Vaping has dramatically increased since 2014 among middle and high school students. Vaping has been shown to be associated with respiratory and cardiovascular problems.
- ❖ Cognitive deficits impair the processing of information, which lead to trouble recalling information and paying attention. Studies have shown that smoking is associated with cognitive deficits in youth.
- ❖ Nicotine, a component in both cigarettes and e-cigarettes, could harm brain development and affect learning, memory, and attention.
- ❖ No other studies have investigated the association of vaping with cognitive deficits in youth, which we will investigate in this current study.

Methods

- ❖ This study used the 2018 NYTS data that included 20,189 participants, a combination of middle and high school students.
- ❖ The predictor variable of smoking and vaping status had four categories: 1) ever dual users 2) exclusive ever cigarette smokers 3) exclusive ever e-cigarette users 4) never users
- ❖ The outcome variable is the self-reported cognitive deficits, which is defined by the answer to the question: "Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?"
- ❖ Covariates include gender, race, use of roll-your-own cigarettes, use of tobacco in hookah, use of snus, how much do you think people harm themselves when they smoke tobacco in a hookah or waterpipe some days but not every day, perception of harm of e-cigarette, perception of addiction of chewing tobacco, and etc.
- ❖ Weighted multivariable logistic regression models were used to determine the association between self-reported cognitive deficits in youth and e-cigarettes use.

Results

- ❖ Ever dual users of e-cigarettes and cigarettes have the highest association with self-reported cognitive deficits.
- ❖ Exclusive ever smokers and exclusive ever vapers have a similar higher association with self-reported cognitive deficits than never users.

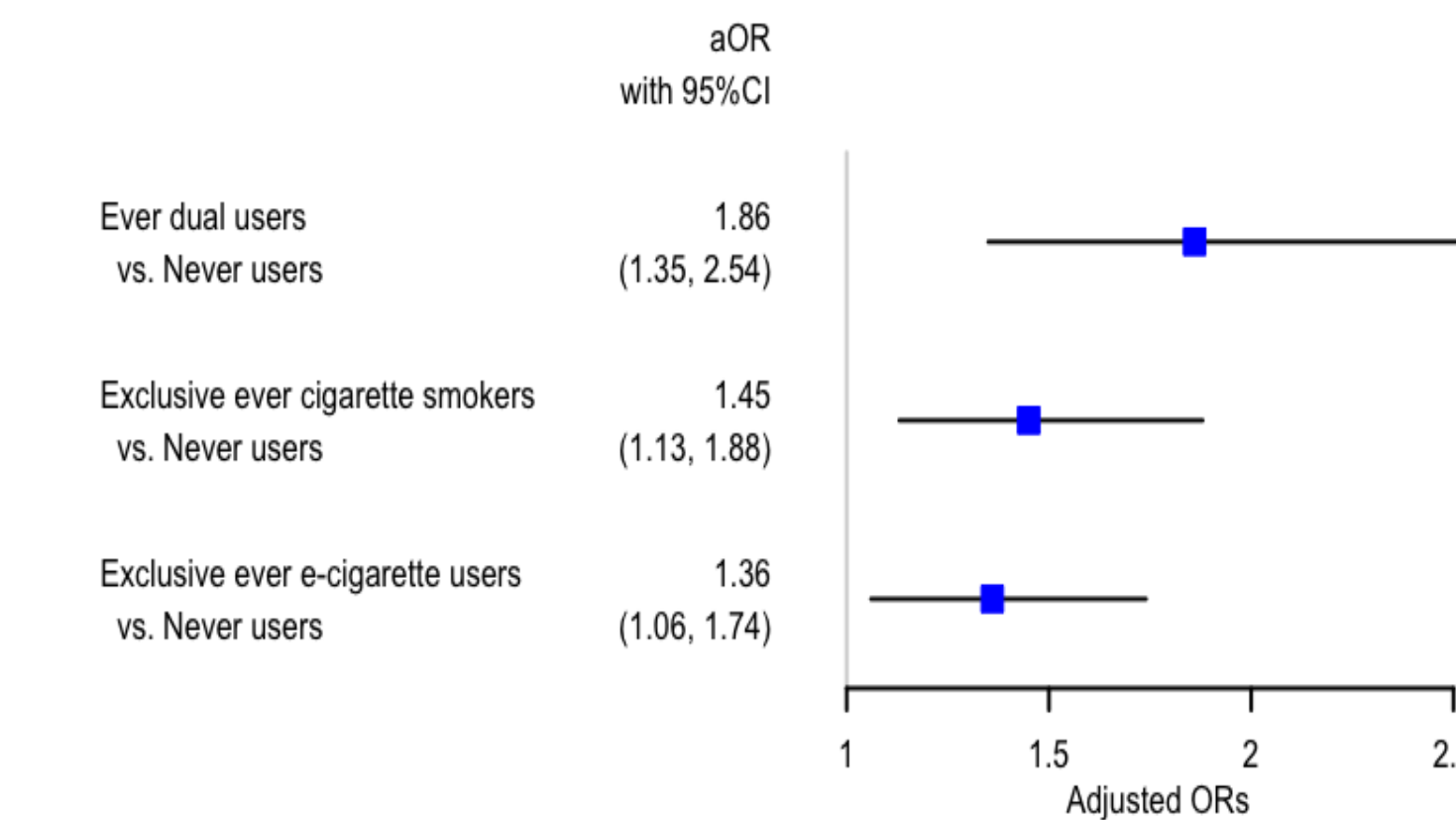


Figure 1: Adjusted odds ratio of self-reported cognitive deficits with smoking and vaping in youth

- ❖ Male students have a significantly higher association with self-reported cognitive deficits compared to female student.
- ❖ Students who started vaping in middle school are more likely to have self-reported cognitive deficits than students who started vaping in high school.

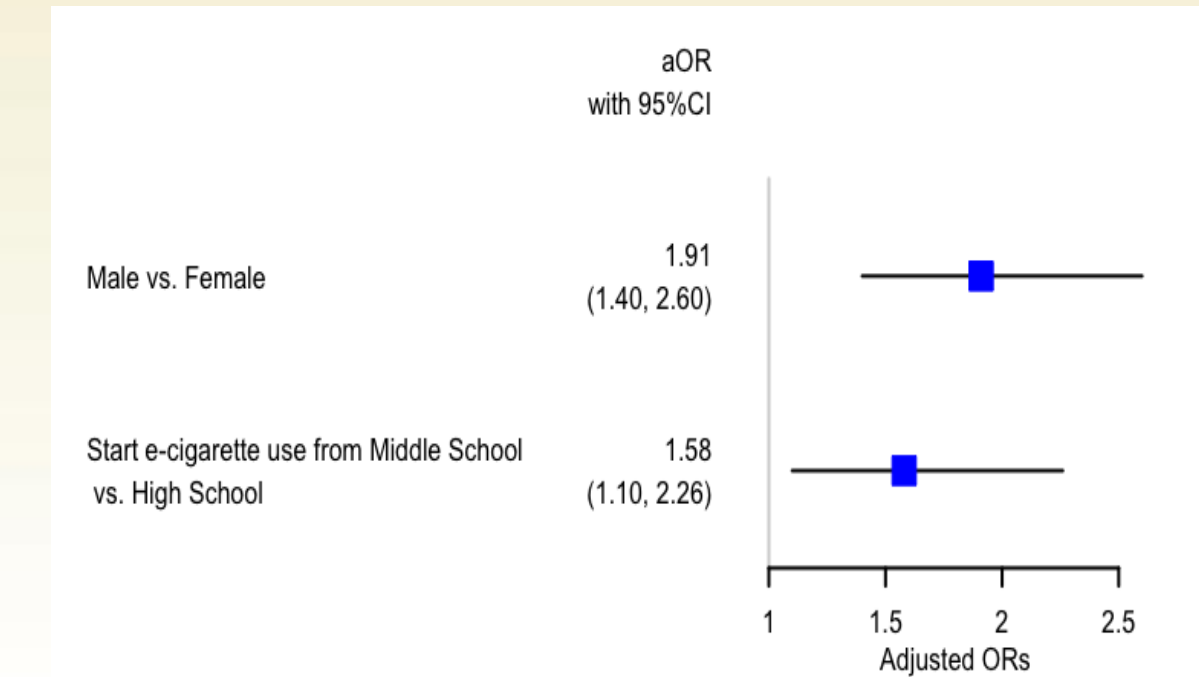


Figure 2: Adjusted odds ratio of self-reported cognitive deficits with gender and the starting time of e-cigarette use

Discussion

- ❖ Similar to previous studies, smokers had a significantly higher association with self-reported cognitive deficits compared to never users in youth.
- ❖ Students who ever vaped had significantly higher association with self-reported cognitive deficits than students who never vaped and smoked.
- ❖ Ever dual users of cigarettes and e-cigarettes showed an higher association with self-reported cognitive deficits than never users.
- ❖ The cross-sectional national survey data do not determine the casual relationship between vaping and self-reported cognitive deficits in youth.
- ❖ The National Youth Tobacco Survey might contain some recall bias.

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