

Association Between Current Established Tobacco Product Use and Attention Deficit/Hyperactivity Disorders (ADHD) Among US Youth: Findings From Wave 3 (2015-2016) of the PATH Study

Bekir KAPLAN, MD¹; Arik V. MARCELL, MD, MPH^{2,3}; Joanna COHEN, PhD¹

1- Institute for Global Tobacco Control, Johns Hopkins Bloomberg School of Public Health

2- Department of Pediatrics, Johns Hopkins Medicine

3- Population, Family & Reproductive Health, Johns Hopkins Bloomberg School of Public Health

Disclosure

- **Funding:** Supported by the National Institute on Drug Abuse of the NIH under Award Number U54DA036105 and the Center for Tobacco Products of the U.S. FDA. The content is solely the responsibility of the author and does not necessarily represent the official views of the NIH or the FDA.
- **Conflict of Interest:** The authors have no conflicts of interest to report

Attention Deficit/Hyperactivity Disorders (ADHD)

- ADHD is one of the most common neurodevelopmental disorders of childhood
- Approximately 70% of those diagnosed with ADHD in childhood persist with ADHD into adolescence
- National estimates suggest that low levels of ADHD symptoms are present in nearly 40% of all adolescents

ADHD and Tobacco Use

- People with ADHD are more likely to:
 - ✓ Smoke cigarettes
 - ✓ Become nicotine-dependent
 - ✓ Start smoking at an earlier age
 - ✓ Have a more difficult time successfully quitting



<https://www.additudemag.com/teen-vaping-adhd-brain-quit/>

- It has been posited that adults with ADHD may smoke to lesson their symptoms of ADHD (“self-medication” hypothesis)

Rationale

- Among youth, there is a well-documented association between ADHD symptoms and use of combustible cigarette smoking
- However, little is known about ENDS use rates among adolescents with ADHD

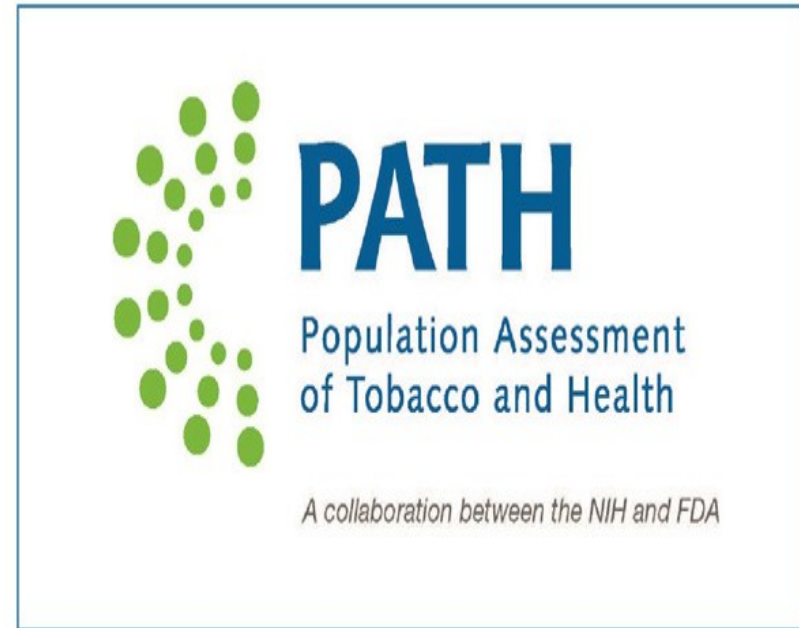
Objective

- The primary aim of this study was to compare the rates of:
 - ✓ **cigarette use only**
 - ✓ **ENDS use only**
 - ✓ **dual use of both cigarettes and ENDS**among youth (12-17y) with and without an ADHD diagnosis in the PATH study Wave 3 (2015-2016) data – a nationally representative sample



Objective

- The secondary aim of this study was to compare:
 - ✓ **Initiation age** of regular use of tobacco products
 - ✓ **Trying to quit** cigarettes or ENDSamong youth with and without an ADHD diagnosis, and **taking ADHD medication** regularly among tobacco user youth with ADHD



Method

- PATH Study Wave 3 youth data (Oct 2015–2016)
- The analytic sample consisted of 11,801 participants aged 12-17
- Outcome variable is ADHD diagnosis based on parent response to the following questions:
 - 1) In the past 12 months, has your child been told by a doctor, nurse or other health professional that {he/she} has ADHD? (coded as yes/no)
 - 2) Has your child ever been told by a doctor, nurse or other health professional that {he/she} has ADHD or ADD? (coded as yes/no)

ADD: Attention Deficit Disorder

Tobacco Use Status Measure

- Created Groups
 - 1) Cigarette only users (n=128)
 - 2) ENDS only users (n=238)
 - 3) Dual user (cigarette and ENDS) (n=83)
 - 4) Non-user (n=10,425)
- Current Cigarette Users: Wave 3 respondents who smoked cigarettes in past 30 days
- Established ENDS Users: Wave 3 respondents who used any electronic nicotine product in past 30 days

Statistical Analyses

- Conducted Chi-square and binary logistic regression models to assess the association between reported ADHD and tobacco use groups
- STATA 15.1 (Stata Corp, College Station, Texas)

Percentages of ADHD diagnosis by tobacco user group & overall

%

(n=1,129)

p<0.001 (Dual users vs Non-users), p=0.044 (ENDS only vs Non-users)

Tobacco use status among adolescents with and without ADHD

$p > 0.05$

Adjusted Odds Ratios (aOR) for ADHD diagnosis

	aOR	95%CI	
Smoking Status			
Non-user (Reference)	1		
Cig + ENDS	3.76	1.86	7.59
Cig Only	1.77	0.97	3.23
	1.68	1.05	2.69
Sex			
Female (Reference)	1		
Male	2.28	1.94	2.68
Age (Years)			
15-17 (Reference)	1		
12-14	1.35	1.16	1.57
Race			
White (Reference)	1		
Black	0.88	0.72	1.08
Other	0.87	0.71	1.06

Percentages of regular tobacco use initiation before 14 years old among US adolescents

%

p>0.05

Percentages of trying to quit in the last 12 months among US Youth

%

$p > 0.05$

Percentages of taking ADHD medication regularly in the past 12 months among adolescents with ADHD diagnosis by tobacco user group

%

p>0.05

Conclusion

- The rates of ENDS only and dual use are higher among youth with ADHD compared to youth without ADHD
- It is critical for health care providers to be screening youth for ENDS use, in addition to cigarette use, especially youth who are diagnosed with ADHD

Limitations

- Data is self-reported
- Cross-sectional data, no causality
- Low sample size of tobacco users

MANY THANKS

For questions: bkaplan9@jhu.edu

www.globaltobaccocontrol.org