

Factors Associated with Past 30-day Abstinence from  
Cigarette Smoking in Adult Established Smokers Who Used a  
JUUL Vaporizer for Six Months

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# Funding Declaration

Funding for this study was provided by JUUL Labs Inc. The study was conducted independently of JUUL Labs Inc. by research staff at the Centre for Substance Use Research.

JUUL Labs Inc. had no input to or control over the study design, contents of the survey instrument, sample recruitment, data analysis, interpretation, or reporting of findings.

Research staff at CSUR alone are responsible for the contents, production and decision to report this study.

# E-cigarette use as an aid to smoking cessation

- Increasing number and heterogeneity of e-cigarette devices (e.g. size, shape, voltage), e-liquids (e.g. flavors, quality, constituents), and use behaviors (e.g. frequency of use in a month/day, puff duration, puff frequency).
- Obtaining data that characterize the efficacy of specific brands, makes and models of e-cigarettes for aiding smoking cessation in real-world and trial settings is key to understanding the potential contribution of each individual e-cigarette product to future population health.

# Assessing the Public Health Impact of JUUL Vapor Products

- The JUUL vaporizer is a pod-based e-cigarette – also called a ‘pod vape’ or ‘pod vaping system’ – that is based on a two-part system: a pre-filled, disposable e-liquid pod that clicks into a small battery.
- Characterising the impact of the speed and size of JUUL’s growth on the population’s use of other, potentially more harmful tobacco products, has become a pressing public health research priority.
- Assessing the effect of JUUL vapor products on adult smokers’ use of conventional tobacco cigarettes can help inform the potential population health impact of these products.

## Research Questions

1. What proportion of adult established cigarette smokers completely stop smoking within their first six months of using JUUL vaping products?
2. What factors increase and decrease an individual's chances of having quit smoking after using using JUUL vaping products for six months?

# Methods

## Sample

15,456 adult established cigarette smokers who had purchased their first JUUL Starter Kit within the past seven days.

- a) 7,633 participants recruited via email invitations sent to e-commerce purchasers of a JSK.
- b) 7,823 participants recruited via invitation cards inserted into packaging of 500,000 JSKs distributed across 10,000 U.S. retail stores.

## Design

- Observational study of naturalistic purchasers
- First online survey completed within 7 days of first purchase of a JSK
- Follow-up surveys completed after 1, 2, 3 and 6 months.
- Each survey took around 15 minutes to complete; participants received USD\$30 for each completed survey.

# Methods

## Primary outcome at each follow-up assessment

- Any cigarettes smoked in the past 30 days (yes/no).

## Data analysis

- Percentage of participants reporting past 30-day abstinence from cigarette smoking at each assessment.
- Percentage of participants who quit smoking between the third and sixth month
- Percentage of participants who resumed smoking between the third and sixth month
- Logistic regression models examining the association between past 30-day cigarette smoking and a range of sociodemographic variables, smoking history variables, and patterns of use of JUUL products.

# Methods

## **Intent-to-treat (ITT) analysis**

- Included all enrolled participants.
- Missing data recoded as “smoked in the past 30 days” under worst-case scenario assumption.

## **Efficacy subset analysis**

- Included only those who responded to each assessment.



## Research Questions

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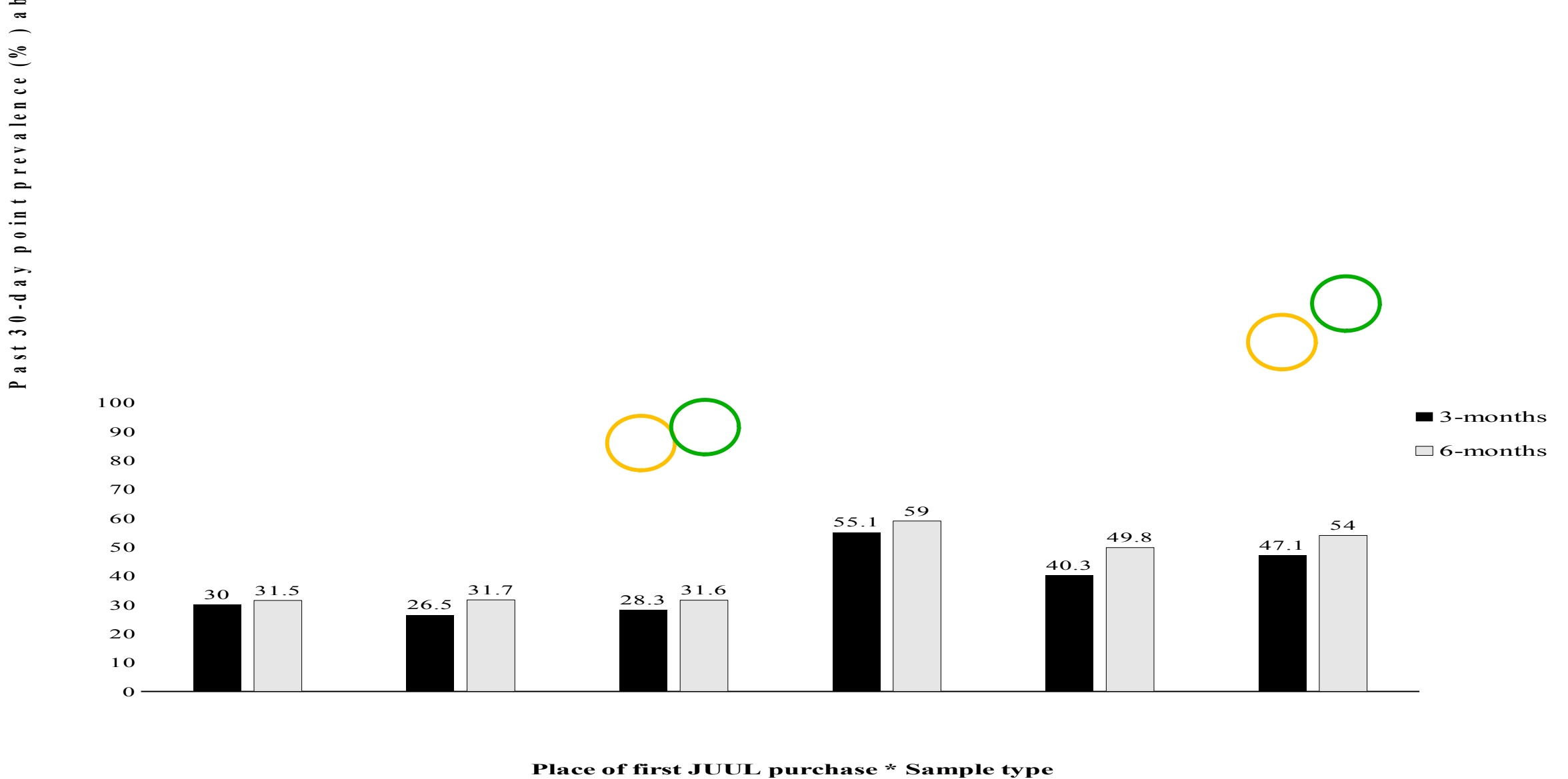


Figure 1. Self-reported past 30-day point prevalence abstinence from smoking assessed at three months and six months after first purchase of a JUUL Starter Kit, stratified by place of first purchase of a JUUL Starter Kit and sample type.

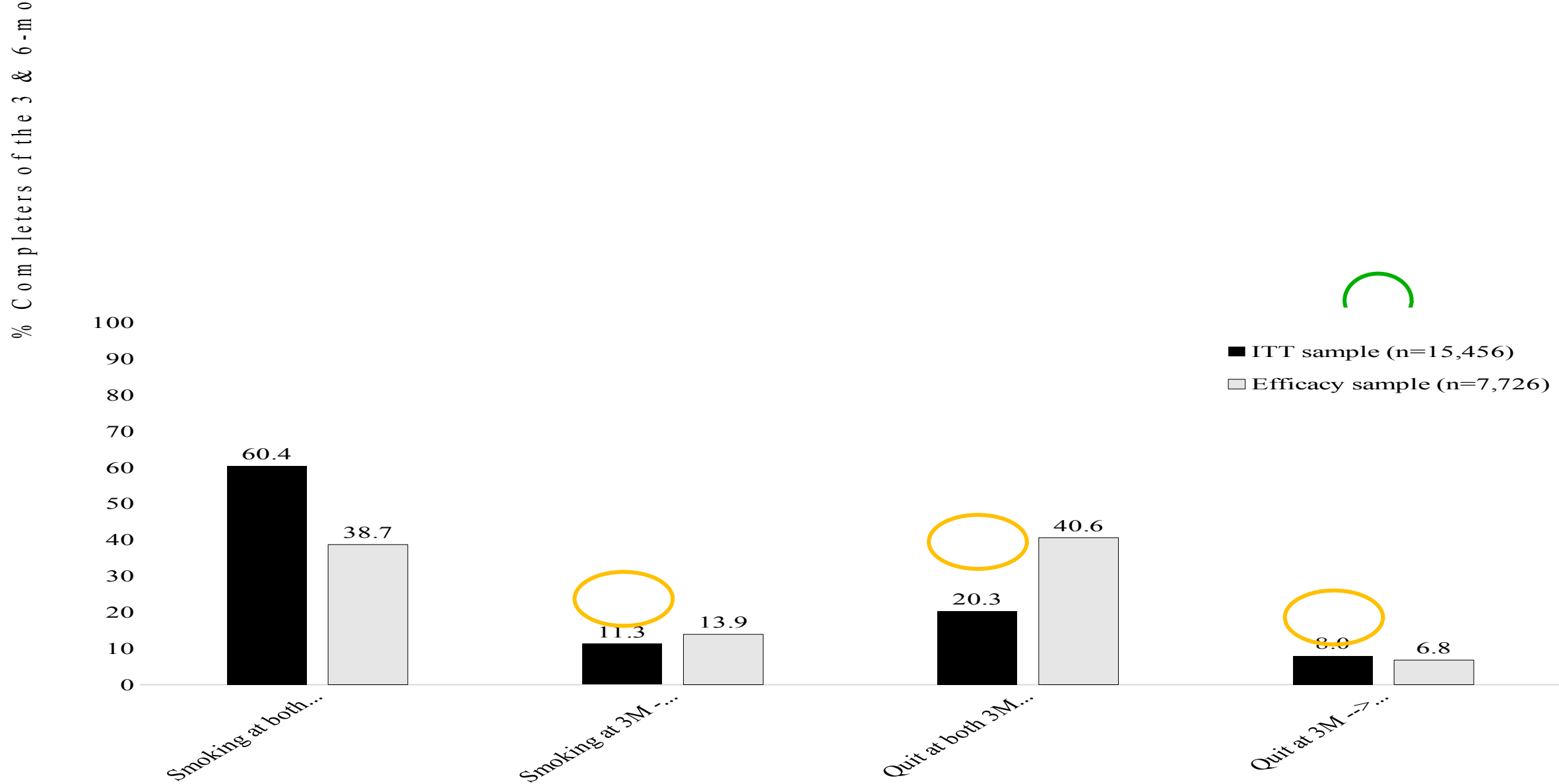


Figure 2. Transitions in cigarette smoking status between the 3-month assessment and the 6-month assessment among new users of a JUUL vaporizer who completed both assessments.

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# (1) Primary JUULpod flavor used in the past 30 days

Predictor Variable	% P30A	Unadjusted	Model 1 Adjusted	
		Unadjusted OR (95% CI)	Step1 aOR (95% CI)	Step2 aOR (95% CI)
<i>Primary JUULpod flavor used in past 30 days (at 6-months)</i>				
Virginia Tobacco	46.9	Ref.	Ref.	Ref.
Mint	59.4	1.66 (1.41-1.94)***	1.46 (1.21-1.77)***	1.51 (1.20-1.92)
Mango	58.7	1.61 (1.38-1.88)***	1.40 (1.16-1.68)***	1.46 (1.16-1.84)
Crème	45.2	0.93 (0.74-1.18)	0.96 (0.73-1.28)	1.06 (0.75-1.50)
Fruit	48.7	1.07 (0.81-1.41)	1.31 (0.95-1.82)	1.35 (0.89-2.05)
Cucumber	49.4	1.10 (0.86-1.42)	0.91 (0.68-1.22)	0.80 (0.56-1.16)
Classic Tobacco	31.8	0.53 (0.37-0.75)***	0.82 (0.54-1.25)	0.80 (0.48-1.32)
Menthol	47.0	1.00 (0.79-1.28)	1.03 (0.77-1.39)	1.04 (0.72-1.50)
Equal use of 2+ flavors, no primary	50.6	1.16 (0.98-1.37)	1.06 (0.87-1.29)	1.00 (0.78-1.28)

\*\*\* p < 0.001; \*\* p < 0.010; \* p < 0.050

## (2) JUULpod flavor categories used in the past 30 days

Predictor Variable	% P30A	Unadjusted	Model 1 Adjusted	
		Unadjusted OR (95% CI)	Step1 aOR (95% CI)	Step2 aOR (95% CI)
<i>JUULpod flavor categories used in the past 30 days (at 6-months)</i>				
Only used JUUL tobacco flavors $\Delta$	43.1	Ref.	Ref.	Ref.
Only used JUUL characterizing flavors $\wedge$	56.3	1.70 (1.47-1.98)***	1.38 (1.15-1.66)**	1.42 (1.14-1.76)**
Used flavors from both tobacco and categories	47.1	1.18 (0.98-1.41)	0.98 (0.79-1.22)	1.03 (0.79-1.35)

\*\*\* p < 0.001; \*\* p < 0.010; \* p < 0.050

$\Delta$  JUULpod tobacco flavors include 'Virginia Tobacco' and 'Classic Tobacco'

$\wedge$  JUULpod characterizing flavors include 'Mint', 'Mango', 'Crème', 'Fruit', 'Cucumber', and 'Menthol'.

### (3) Number of days of use of a JUUL vaporizer in the past 30 days

Predictor Variable	% P30A	Unadjusted	Model 1 Adjusted	
		Unadjusted OR (95% CI)	Step1 aOR (95% CI)	Step2 aOR (95% CI)
<i>Number of days of use of a JUUL vaporizer in the past 30 days (at 6-months)</i>				
1-9 days	40.6	0.45 (0.39-0.52)***	0.38 (0.30-0.46)***	0.38 (0.31-0.45)***
10-19 days	40.4	0.44 (0.39-0.51)***	0.39 (0.33-0.46)***	0.39 (0.33-0.46)***
20-29 days	47.5	0.59 (0.53-0.67)***	0.45 (0.39-0.52)***	0.45 (0.39-0.52)***
30 days	60.4	Ref.	Ref.	Ref.

\*\*\* p < 0.001; \*\* p < 0.010; \* p < 0.050

## (4) Purchased first JUUL Starter Kit to help quit smoking

Predictor Variable	% P30A	Unadjusted	Model 1 Adjusted	
		Unadjusted OR (95% CI)	Step1 aOR (95% CI)	Step2 aOR (95% CI)
<i>Bought JUUL SK 'to help me quit smoking'</i>				
Yes	47.4	1.08 (0.97-1.21)	1.34 (1.16-1.55)***	1.35 (1.17-1.55)***
No	45.5	Ref.	Ref.	Ref.

\*\*\* p < 0.001; \*\* p < 0.010; \* p < 0.050



## (5) Purchased first JUUL Starter Kit in a retail store

Predictor Variable	% P30A	Unadjusted	Model 1 Adjusted	
		Unadjusted OR (95% CI)	Step1 aOR (95% CI)	Step2 aOR (95% CI)
<i>Place of first JUUL purchase</i>				
Retail store	55.1	1.81 (1.67-1.97)***	1.37 (1.22-1.53)***	1.39 (0.99-1.94)
JUUL website	40.3	Ref.	Ref.	Ref.

\*\*\* p < 0.001; \*\* p < 0.010; \* p < 0.050

# Conclusions

- This study prospectively assessed rates of self-reported past 30-day abstinence from cigarette smoking in a large cohort of U.S. adult established current smokers up to six months after their first purchase of a JUUL vaporizer.
- In a worst-case scenario in which non-respondents to survey assessments were assumed to be smoking cigarettes, past 30-day point prevalence abstinence from cigarette smoking increased from 28.3% at 3-months to 31.6% at 6-months
- 20.3% of participants reported consecutive past 30-day smoking abstinence outcomes at three and six months.

# Conclusions

A higher rate of quitting smoking (11.3%) than lapsing to smoking (8.0%) was observed between the third and sixth month of using a JUUL vaporizer.

Quit rates at six months were significantly higher among:

1. Daily users of a JUUL vaporizer
2. Primary users of Mint and Mango flavored JUULpods
3. Exclusive users of JUULpods containing non-tobacco flavors
4. Those who purchased a JUUL as an aid to smoking cessation
5. Those who purchased their first JUUL in a retail store.

# Conclusions

- Few publicly available data that characterize the risk/safety profile of JUUL vapor products relative to combustible cigarettes, other ENDS products, and FDA-approved smoking cessation products and medications.
- These data are urgently needed to position JUUL vaping products on a tobacco product continuum of health risk.

# Limitations

- Sample not representative of all U.S. adults or users of other brands of e-cigarette.
- No data were collected in this study on use of JUUL products by adolescents, or the impact of using JUUL products during adolescence on health and use of other tobacco products.
- JUUL vapor products cannot be demonstrated to be appropriate for the protection of the public health without such data.
- No one study can prove or disprove anything; truth emerges through replication and consensus of evidence.

## **Final Thought – Preventing Smoking-Related Harm**

- 67% of participants who were still using a JUUL vaporizer and participating in the study after six months were aged 21-25 years.
- 61.7% of those aged 21-24 years had quit smoking at six months.
- 52.9% of those aged 21-24 years had quit smoking at six months.
- Potential for JUUL and other vaping products to prevent smoking-related harm by appealing to and quickly diverting young adult smokers out of smoking at a younger age before harm has accumulated and addiction has peaked.

Thanks for listening!

Questions?

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