

Association of Initial JL ENDS Subjective Effects and Subsequent JL ENDS Use and Smoking Among Never and Former Established Smokers

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Introduction

- Evidence suggests that initial responses (i.e., subjective effects) to use of tobacco products may be associated with subsequent patterns of use.¹
- Previous studies have assessed subjective effects of electronic nicotine delivery systems (ENDS), however, there is little data on subjective effects of the JL ENDS (JUUL Labs, Inc.).
- This longitudinal study of first-time JL ENDS Starter Kit (a package that includes a JL ENDS device, a USB charging dock, and one e-liquid pod in each of four flavors [1x Virginia Tobacco, 1x Mint, 1x Mango and 1x Creme] at 5.0% nicotine concentration) purchasers, who were Former and Never Established Smokers, assessed if initial experiences at baseline were prospectively associated with continued past 30-day JL ENDS use and combustible cigarette smoking across a 1-year period.

Methods

- Adult Former Established Smokers (ever smoked cigarettes, smoked ≥ 100 cigarettes in lifetime, did not smoke in past 30 days; **Table 1**) and Never Established Smokers (never smoked cigarettes or smoked < 100 cigarettes in lifetime; **Table 1**) who recently purchased JL ENDS completed baseline, 1-, 2-, 3-, 6-, 9- and 12-month follow-up assessments as part of a prospective cohort study.
- At baseline, participants completed a version of the modified Cigarette Evaluation Questionnaire (mCEQ)² adapted for JL ENDS that assessed subjective effects including 'Satisfaction', 'Psychological Reward', 'Enjoyment of Sensations in the Respiratory Tract', 'Aversion' and 'Craving Reduction'.
- At each follow-up assessment, participants reported if they had used JL ENDS and/or smoked in the past 30-days (yes/no).
- Repeated-measure logistic regression models, adjusted for sociodemographic and smoking characteristics assessed associations of initial subjective effects from JL ENDS use at baseline and past 30-day JL ENDS use or smoking averaged across all follow-up assessments.

Results

- Among Former Established Smokers, after adjustment for sociodemographic and smoking covariates, greater initial "Satisfaction" (aOR [95% CI] = 1.38 [1.24, 1.53]), "Psychological Reward" (aOR [95% CI] = 1.11 [1.03, 1.21]) and "Enjoyment of Sensations in Respiratory Tract" (aOR [95% CI] = 1.15 [1.07, 1.24]) were significantly associated with increased odds of continued past 30-day JL ENDS use across follow-up (**Table 2**).
- Among Never Established Smokers, greater initial "Satisfaction" (aOR [95% CI] = 1.28 [1.22, 1.35]), "Psychological Reward" (aOR [95% CI] = 1.14 [1.10, 1.19]), "Enjoyment of Sensations in Respiratory Tract" (aOR [95% CI] = 1.16 [1.12, 1.20]) and "Craving Reduction" (aOR [95% CI] = 1.08 [1.05, 1.11]) were significantly associated with increased odds of continued

past 30-day JL ENDS use across the follow-up period (**Table 3**).

- Among Former Established Smokers, greater initial "Enjoyment of Sensations in the Respiratory Tract" (aOR [95% CI] = 0.91 [0.86, 0.96]) from JL ENDS use was significantly associated with decreased odds of subsequent past 30-day combustible cigarette smoking across follow-up (**Table 4**).
- Among Never Established Smokers, greater initial "Satisfaction" (aOR [95% CI] = 0.91 [0.88, 0.95]), "Psychological Reward" (aOR [95% CI] = 0.96 [0.93, 0.99]) and "Craving Reduction" (aOR [95% CI] = 0.95 [0.93, 0.97]) from initial JL ENDS use at Baseline were significantly associated with decreased odds of subsequent past 30-day combustible cigarette smoking across follow-up (**Table 5**).

Table 1: Smoking Status Definitions

Baseline Smoking Status	Definition	Derivation
Former Established Smoker	<ul style="list-style-type: none"> Ever smoked cigarettes, even one or two puffs; and Smoked 100 or more cigarettes in their entire life; and Have not smoked in past 30 days 	<ul style="list-style-type: none"> Ever smoking = 'Yes'; and Lifetime smoking ≥ 100 cigarettes; and Past 30 day smoking = 'No'
Never Established Smoker	<ul style="list-style-type: none"> Never smoked cigarettes, not even one puff or Ever smoked cigarettes, even one or two puffs; and Smoked less than 100 cigarettes in their entire life 	<ul style="list-style-type: none"> Ever smoking = 'No'; or Ever smoking = 'Yes'; and Lifetime smoking < 100 cigarettes

Note: Ever Smoking = "Have you ever smoked a cigarette, even one or two puffs?"
Lifetime smoking = "How many cigarettes have you smoked in your entire life? A pack usually has 20 cigarettes in it."
Past 30-day Smoking = "In the past 30 days, have you smoked a cigarette, even one or two puffs?"
Items were only asked at the Baseline assessment.

Table 2: Association of Initial Subjective Effects and Subsequent Past 30-Day JL ENDS Use Among Former Established Smokers Averaged Across all Follow-Ups

Initial Subjective Effects	Past 30-Day JL ENDS Use Across Follow-Up Period Unadjusted OR (95% CI)	Past 30-Day JL ENDS Use Across Follow-Up Period Adjusteda OR (95% CI)
Satisfaction	1.32 (1.21, 1.44)	1.38 (1.24, 1.53)
Psychological Reward	1.12 (1.05, 1.20)	1.11 (1.03, 1.21)
Aversion	0.88 (0.82, 0.95)	0.87 (0.80, 0.94)
Enjoyment of Sensations in Respiratory Tract	1.14 (1.07, 1.21)	1.15 (1.07, 1.24)
Craving Reduction	1.05 (1.00, 1.11)	1.07 (1.00, 1.14)

Note: ^aAdjusted for sociodemographic and smoking characteristics.
Unadjusted models: N=16,079-16,193 observations.
Adjusted models: N=12,643-12,727 observations.
Craving Reduction was only assessed among past 30-day smokers.

Table 3: Association of Initial Subjective Effects and Subsequent Past 30-Day JL ENDS Use Among Never Established Smokers Averaged Across Follow-Up Period

Initial Subjective Effects	Past 30-Day JL ENDS Use Across Follow-Up Period Unadjusted OR (95% CI)	Past 30-Day JL ENDS Use Across Follow-Up Period Adjusteda OR (95% CI)
Satisfaction	1.27 (1.22, 1.32)	1.28 (1.22, 1.35)
Psychological Reward	1.11 (1.07, 1.15)	1.14 (1.10, 1.19)
Aversion	0.95 (0.92, 0.98)	0.97 (0.94, 1.01)
Enjoyment of Sensations in Respiratory Tract	1.15 (1.11, 1.18)	1.16 (1.12, 1.20)
Craving Reduction	1.09 (1.06, 1.12)	1.08 (1.05, 1.11)

Note: ^aAdjusted for sociodemographic and smoking characteristics.
Unadjusted models: N=37,317-48,823 observations.
Adjusted models: N=30,346-39,884 observations.
Craving Reduction was only assessed among past 30-day smokers.

Table 4: Association of Initial Subjective Effects and Subsequent Past 30-Day JL ENDS Use Among Never Established Smokers Averaged Across Follow-Up Period

Initial Subjective Effects	Past 30-Day Cigarette Smoking Across Follow-Up Period Unadjusted OR (95% CI)	Past 30-Day Cigarette Smoking Across Follow-Up Period Adjusteda OR (95% CI)
Satisfaction	1.02 (0.96, 1.09)	0.93 (0.87, 1.00)
Psychological Reward	1.03 (0.99, 1.08)	0.95 (0.90, 1.00)
Aversion	1.11 (1.05, 1.17)	1.04 (0.98, 1.10)
Enjoyment of Sensations in Respiratory Tract	0.96 (0.92, 1.01)	0.91 (0.86, 0.96)
Craving Reduction	1.01 (0.97, 1.05)	0.96 (0.92, 1.00)

Note: ^aAdjusted for sociodemographic and smoking characteristics.
Unadjusted models: N=15,321-16,013 observations.
Adjusted models: N=12,078-12,605 observations.
Craving Reduction was only assessed among past 30-day smokers.

Table 5: Association of Initial Subjective Effects and Subsequent Past 30-Day Combustible Cigarette Smoking Among Never Established Smokers Averaged Across Follow Up Period

Initial Subjective Effects	Past 30-Day Cigarette Smoking Across Follow-Up Period Unadjusted OR (95% CI)	Past 30-Day Cigarette Smoking Across Follow-Up Period Adjusteda OR (95% CI)
Satisfaction	0.95 (0.92, 0.98)	0.91 (0.88, 0.95)
Psychological Reward	0.95 (0.92, 0.97)	0.96 (0.93, 0.99)
Aversion	0.94 (0.92, 0.97)	1.00 (0.97, 1.03)
Enjoyment of Sensations in Respiratory Tract	0.99 (0.97, 1.01)	0.97 (0.95, 1.00)
Craving Reduction	0.97 (0.95, 0.98)	0.95 (0.93, 0.97)

Note: ^aAdjusted for sociodemographic and smoking characteristics.
Unadjusted models: N=36,571-47,850 observations.
Adjusted models: N=29,874-39,262 observations.

Conclusions

- Across the 1-year follow-up period, early positive responses to JL ENDS use among Former and Never Established Smokers were significantly associated with:
 - Increased odds of subsequent past 30-day JL ENDS use
 - Decreased odds of subsequent past 30-day combustible cigarette smoking
- These findings suggest that the ability of the JL ENDS to deliver positive subjective effects (i.e., appeal and satisfaction) to Former and Never Established Smokers may be an important factor in maintaining JL ENDS use and preventing combustible cigarette smoking.

References

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