

# E-Cigarette Use Among High School Students – a Cross-Sectional Study of Associated Risk Factors for the Use of Flavour-Only and Nicotine Vapes

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## Introduction

E-cigarette use (vaping) has rapidly increased among adolescents and young people recently world-wide, creating global public health concern due to associated short- and potentially long-term harms<sup>1</sup>.

In Australia, the proportion of **14-19-year-olds who vaped regularly increased from 1.5% in 2016 to 2.8% in 2019**, and the proportion of those who had ever used in their lifetime increased from 12.6% to 14.5%<sup>2</sup>.

To date, there have been a lack of studies conducted which investigate the patterns of use and individual characteristics associated with vaping among Australian adolescents.

The current study sought to address this gap by investigating e-cigarette use among high school students in Australia. This study assessed the prevalence of vaping among a large sample of Grade 12 students and identified the individual characteristics cross-sectionally associated with e-cigarette use, differentiating between flavour-only vapes and vapes containing nicotine.



## Method

855 Grade 12 students ( $M_{age}=17.17$ ,  $SD=0.41$ ; 60% male) from nine high schools in South-East Queensland, Australia, individually completed a self-report survey during class in June - October 2020. All students were entered in the draw to win an iPad for completing the survey.

The survey took students 30 - 45 minutes to complete and included a variety of measures for the Adolescent Aware project\*, which examined associates of bullying, underage drinking, substance use and wellbeing in adolescence.

### The current study used:

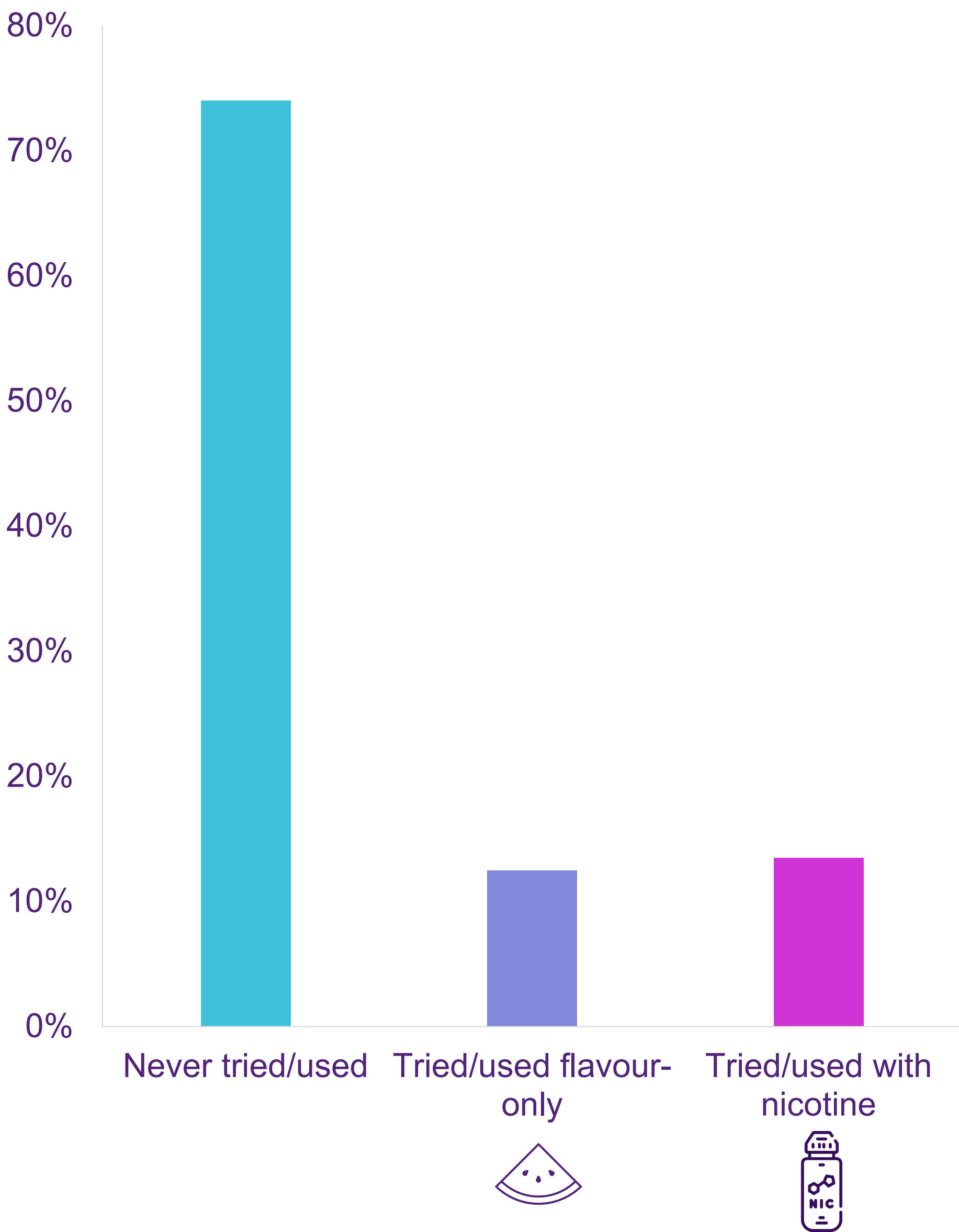
#### – E-cigarette items

- Ever used (even just once or twice) and if yes,
  - How recently (in the past month, 1-12-months, or > 12-months ago),
  - Type (flavour-only, nicotine) of vape used.

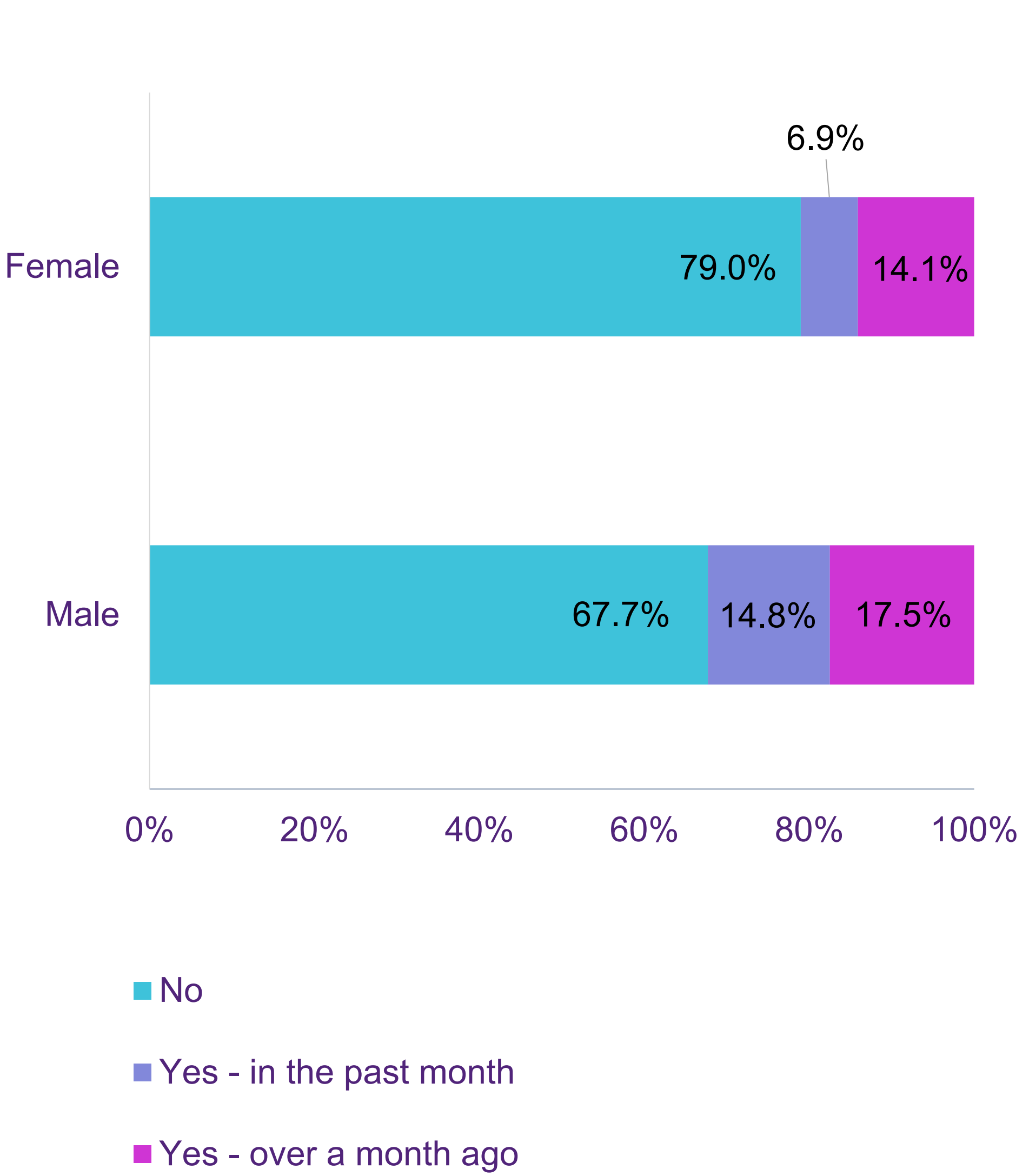
#### – Individual risk factor correlates

- Age
- Gender
- Aboriginal or Torres Strait Islander status
- Parental and family characteristics
- Truancy
- Depression
- Social anxiety
- Alcohol use
- Cigarette smoking

## Lifetime E-Cigarette Use by Type



## Lifetime E-Cigarette Use by Gender



**Figure 1 (from left to right):** Graphs depict the proportion of lifetime e-cigarette use by type (never tried, tried/ flavour only and tried/ nicotine) and the proportion of lifetime e-cigarette use by most recent time used (no, yes – in the past month, yes – over a month ago) and gender (male, female).

## Results

### Individual Risk Factors

Multinomial regression results (see Table 1) revealed:

- Males were over twice as likely to have tried flavour-only vapes than females.
- Students who reported frequent alcohol use (2-3 times a month or more) were twice as likely to have used flavour-only vapes and 3 times more likely to have used vapes containing nicotine.
- Students who smoked cigarettes occasionally were 4 times more likely to have used vapes containing nicotine, and those who smoked cigarettes weekly/ daily were over 40 times more likely to have used nicotine vapes, though this was not statistically significant.
- Students who truanted in the past had higher odds of using e-cigarettes, however this was not significant.

### Prevalence

- 74% students reported never using an e-cigarette or vaped.
- Of the 26% that reported using a vape in their lifetime, 12.5% had used a flavour-only vape and 13.5% had used a vape containing nicotine.
- A higher proportion of males reported using an e-cigarette in the past month and over a month ago, than females ( $p < .001$ ).

	Tried/ Flavour-only		Tried/ Nicotine	
	OR(95%CI)	p	OR (95%CI)	p
<b>Gender</b>				
- Male	2.26 (1.28-3.99)	.005	1.64 (0.71-3.79)	.524
- Female	1.00 (ref)	-	1.00 (ref)	-
<b>Frequent Alcohol Use</b>				
- No	1.00 (ref)	-	1.00 (ref)	-
- Yes	2.14 (1.28-3.57)	.004	3.26 (1.37-7.80)	.010
<b>Cigarette smoking</b>				
- Never	1.00 (ref)	-	1.00 (ref)	-
- Some	3.92(2.20-6.99)	<.001	16.07(6.29-41.08)	<.001
-Weekly/Daily	2.95(0.74-11. 77)	.123	43.77(15.95-120.06)	<.001
<b>Truancy</b>				
- No	1.00 (ref)	-	1.00 (ref)	-
- Yes	1.37 (0.70-2.70)	.360	1.18 (0.51-2.75)	.690

**Table 1:** Consolidated table summarising multinomial regression results on e-cigarette use by gender, alcohol use, cigarette smoking and truancy.

## Conclusions

Of the adolescents who had used e-cigarettes, over half had used a vape containing nicotine. Males were more likely than females to have tried a flavour-only vape and students who engaged in risky drinking or cigarette smoking were most likely to use e-cigarettes.

## Implications for Practice

Adolescents who engage in risky drinking and cigarette smoking may present as a high-risk group for e-cigarette use. Developing prevention and early-intervention programs that target adolescents in these high-risk groups is important in reducing the uptake and potential harms associated with e-cigarette use.



\* The Adolescent Aware project is a 6-year longitudinal school-based study, run by researcher from The University of Queensland and Queensland University of Technology.