

E-cigarette use and other risk factors associated with tobacco smoking susceptibility among Australian adolescents

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Submitted: 6 March 2023; Revision requested: 6 July 2023; Accepted: 12 July 2023

Abstract

Objective: To explore risk factors for smoking susceptibility among Australian adolescents to inform prevention policies and programs.

Methods: Cross-sectional survey of students aged 12–17 years who reported having never smoked (n=4,171). Bivariate associations between smoking susceptibility and a range of factors previously linked to youth smoking and smoking susceptibility were initially examined, with significant factors ($p<0.05$) included in a final multivariable logistic regression model.

Results: Eleven percent of adolescents who had never smoked were susceptible to smoking. Smoking susceptibility was independently associated with ever use of e-cigarettes (adjusted odds ratio [AOR]=3.26, 95% confidence interval [CI]: 1.83–5.81), perceiving those who smoke to be more popular (AOR=2.87, 95% CI: 1.62–5.10), having a close friend/s who smokes (AOR=2.66, 95% CI: 1.61–4.40), not perceiving smoking one or two cigarettes occasionally as personally dangerous (AOR=2.56, 95% CI: 1.61–4.09), and having symptoms of depression (AOR=1.59, 95% CI: 1.06–2.38).

Conclusions: The strongest smoking-initiation risk factor identified was ever use of e-cigarettes, with social norms, harm misperceptions around low-rate tobacco use and mental health also linked to smoking susceptibility.

Implications for Public Health: Stronger e-cigarette regulations that reduce promotion to and access by youth, as well as interventions addressing the other identified risk factors, may help prevent future smoking uptake among Australian adolescents.

Key words: adolescent health, smoking susceptibility, e-cigarettes, prevention, cross-sectional survey

Introduction

Although the prevalence of smoking among Australian adolescents has declined substantially in recent decades,¹ it remains a major public health challenge. In 2017, almost one in ten (9%) Australian 16–17-year-old and 3% of 12–15-year-old secondary school students reported having smoked in the past week, with no decline in prevalence between 2014 and 2017.² Concerningly, there is evidence to suggest that smoking rates have actually increased between 2018 and 2022 among 14- to 17-year-olds in Australia.³ The implementation of comprehensive tobacco control programs, including reducing the affordability and accessibility of tobacco products, restricting tobacco advertising and promotion, and

media campaigns, are effective in reducing smoking among young people.⁴ A lack of progress in recent years in reducing smoking among Australian adolescents has been at least partly attributed to a dearth of government investment in integrated multimedia campaigns as well as the proliferation of new products and brand names that appeal to young people and that fall outside current legislation.⁵

In addition to effective regulations and policies, preventive strategies that target youth who have never smoked yet are susceptible to smoking uptake are an important component of tobacco control. Preventing young people from starting to smoke is effective and cost-effective⁶ and has lifelong health, social, and economic benefits. The large majority of adults who smoke report having started smoking

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Aust NZ J Public Health. 2023; Online; <https://doi.org/10.1016/j.anzjph.2023.100076>

when they were teenagers,⁴ hence adolescence represents a critical period for preventing smoking uptake and averting its enormous harms. Adolescents become more easily and rapidly addicted to nicotine than adults,⁷ even at lower or more intermittent levels of use,⁸ and a younger age of uptake increases the likelihood of progression to heavier consumption and long-term addiction.⁹ Adolescents often have a poor understanding of health risks and addiction and overestimate their ability to stop smoking at will,¹⁰ despite evidence that over two-thirds of people who try one cigarette go on to smoke daily.¹¹ Identifying young people most at risk for smoking uptake is, therefore, important to most effectively direct interventions and resources, with the aim of preventing smoking experimentation and progression.

Susceptibility to smoking, defined as the lack of a firm commitment not to smoke, is a strong, independent predictor of smoking experimentation among young people.^{12,13} Recent studies examining smoking susceptibility among adolescents who have never smoked have identified a range of correlates: demographic factors (race/ethnicity,¹⁴ sex¹⁴); social factors (smoking status of peers^{15–18} and family members^{16,17,19}); amount of pocket money^{15,16}; school-based factors, such as attendance¹⁶; social norms (exposure to second-hand smoke in public^{15,19–21} and smoking in the media^{15,21}); knowledge and education about smoking and addiction^{15,22,23}; exposure to tobacco advertising and promotion^{19,21–24}; negative attitudes to smoking¹⁶; perceptions of smokers as attractive and cool^{25,26}; wellbeing and temperament of the young person^{16,17}; use of other substances.^{17,18} Addressing such risk factors has been highlighted as an important tenet of achieving further reductions in adolescent smoking prevalence.²³

In addition to the factors above, the use of e-cigarettes among young people is of increasing concern, both in terms of addiction and health risks, but also in promoting tobacco use. This is highlighted by the observed rise in smoking among 14- to 17-year-olds in Australia between 2018 and 2022 occurring alongside a steep increase in vaping among this age group across the same time period.³ A recent systematic review found that people who have never smoked who use e-cigarettes have about three times the odds of smoking uptake compared with non-e-cigarette users.²⁷ In 2017, almost half (46%) of Australian secondary students who had ever tried vaping had never smoked at the time of their first vape.²⁸ A 2021 survey of 721 teenagers in New South Wales similarly found that more than half (54%) of those who had ever vaped had never smoked before they first tried vaping.²⁹ Although the association between vaping and subsequent tobacco smoking is also apparent among young people at low-risk of smoking uptake,³⁰ research in the US has found that adolescents who are susceptible to smoking are significantly more likely to report e-cigarette use.²³

Research in Australia has found that certain groups of young people are more likely to report smoking; for example, Aboriginal and Torres Strait Islander youth,³¹ those who use alcohol and cannabis,³¹ flavoured tobacco products,³² or e-cigarettes,²⁸ those with mental disorders,³³ and those with parents who smoke.³⁴ However, factors associated with smoking susceptibility among Australian adolescents who have never smoked have not previously been explored. Such factors can vary depending on country-specific tobacco control policies, prevention strategies, and cultural and social norms.¹⁵ Identifying adolescents most at risk for smoking uptake in the Australian context can, therefore, inform the development and

targeting of prevention policies and programs with the goal of renewing declines in adolescent smoking prevalence, with research showing that such interventions can reduce smoking susceptibility and tobacco use among young people.³⁵ Decreases in smoking uptake also support the broader goal of reducing the prevalence of smoking in Australia, as much of the decline in smoking prevalence among adults over time has been due to young people not taking up smoking in the first place, rather than increases in people who smoke quitting.³⁶

The present study aims to examine whether a range of factors previously linked to smoking and smoking susceptibility—socio-demographic variables; mental health; use of e-cigarettes, alcohol, and other substances; parent and peer smoking; school achievement; and attitudes towards and perceptions of tobacco use and people who smoke—are associated with smoking susceptibility in a large, representative sample of Australian secondary students who have never smoked.

Methods

Sample and procedure

The sample comprised Victorian adolescents aged 12–17 years who participated in the 2017 Australian Secondary Students' Alcohol and Drug (ASSAD) survey, a large triennial cross-sectional study of students in year levels 7–12. A stratified two-stage probability design was used whereby schools were first selected proportionally from the three education sectors (government, Catholic, independent) and then non-streamed classes (i.e. not formed based on academic ability or interest) were selected within schools. Where a selected school declined to participate, they were replaced in the sample by a school with similar characteristics (e.g. education sector, geographic catchment). Approval to conduct the survey was received from Cancer Council Victoria's Human Research Ethics Committee, relevant education authorities, and school principals. Student participation in the survey required informed consent from both the student and their parent/carer.

The survey was administered to the selected classes of students in participating schools on an agreed day between May and December 2017 by research staff in line with standard procedures. Students completed the pen-and-paper questionnaire independently and anonymously. A total of 4,266 Victorian students from 57 schools participated in the 2017 ASSAD survey (school response rate: 13%). The current study was restricted to students who reported having never smoked even part of a cigarette and had a valid response to the smoking susceptibility measure (n=3,410).

Measures

Susceptibility to smoking

Susceptibility to smoking was measured using the following single-item question: "Do you think you will be smoking cigarettes this time next year?" (*certain not to be smoking, very unlikely to be smoking, unlikely to be smoking, can't decide how likely, likely to be smoking, very likely to be smoking, certain to be smoking*). Consistent with previous studies,^{12,13,23,37} students who did not indicate a firm intention not to smoke cigarettes (i.e. gave a response other than *certain not to be smoking*) were categorised as being susceptible to smoking.

Table 1: Demographic characteristics of the study sample and the Victorian population.

	Study sample		Victorian population ^a
	Unweighted (n=3,410)	Weighted (n=3,468)	
	%	%	%
Sex			
Male	44.2	50.3	50.9
Female	55.8	49.7	49.1
Age (years)			
12	11.2	20.0	17.3
13	28.1	19.7	17.1
14	17.0	18.2	17.0
15	15.1	16.4	16.8
16	16.8	14.6	16.5
17	11.7	11.0	15.3
Socio-economic area^b			
Low (1-40%)	37.0	35.8	35.7
Mid (41-80%)	37.7	41.7	39.9
High (81-100%)	25.3	22.5	24.4
Geographic location^c			
Metropolitan	66.5	70.8	73.5
Regional/rural	33.5	29.2	26.5
Aboriginal and/or Torres Strait Islander^d			
No	97.4	97.5	98.4
Yes	2.6	2.5	1.6
Weekly income/allowance^e			
None	16.6	18.6	-
\$1 to \$40	56.6	55.6	-
\$41 to \$80	10.4	10.4	-
\$81 or more	16.3	15.4	-

Notes: Percentages are rounded so may not sum to 100%.

^aVictorian population distributions were calculated using data from the Australian Bureau of Statistics among the general population for socio-economic area³⁸ and geographic location,⁵⁸ and among students aged 12 to 17 years for sex, age and Aboriginal and/or Torres Strait Islander status.⁴²

^bSocio-economic area information was missing for n=25 students.

^cGeographic location information was missing for n=22 students.

^dAboriginal and/or Torres Strait Islander information was missing for n=20 students.

^eWeekly income/allowance information was missing for n=33 students.

Socio-demographic characteristics

Information on students' sex, age, residential postcode, and whether they are of Aboriginal and/or Torres Strait Islander descent was collected. Residential postcode was used to compute the measures of socio-economic area (using the Socio-Economic Index for Areas (SEIFA) Index of Relative Socio-economic Disadvantage)³⁸ and geographic location (using the Australian Statistical Geography Standard Remoteness Structure).³⁹ Students were also asked "During a normal week, how much money do you have available to spend on yourself (e.g., from pocket money, part-time job)?" with 12 pre-coded response options given. Responses were collapsed into 'none', '\$1 to \$40', '\$41 to \$80' and '\$81 or more' categories.

Mental health

Students reported if they had ever been diagnosed or told by a doctor or nurse that they had a mental health condition. Students also

completed the 13-item Short Mood and Feelings Questionnaire to assess their experiences of depression symptoms in the past two weeks.⁴⁰ Each item was rated on a 3-point scale (0 = *not true*, 1 = *sometimes true*, 2 = *true*) with a total score derived by summing the individual ratings (range: 0-26). A Short Mood and Feelings Questionnaire score of ≥ 12 was used as the cut-point for probable depression, as this score was identified as the optimal cut-off value for differentiating depressed from non-depressed cases in a sample of New Zealand help-seeking adolescents.⁴¹

School ability and absenteeism

Self-reported academic ability was recorded with students indicating whether they considered themselves *a lot above average*, *above average*, *average*, *below average*, or *a lot below average* at school work. School absenteeism was measured by asking students whether they were at school on the last school day.

Use of other risky substances

Several indicators of the use of other risky substances were measured. Specifically, students were asked (i) if they had ever used battery operated electronic cigarettes (e-cigarettes), (ii) if they had ever smoked or used shisha tobacco or hookah or waterpipe, (iii) the number of alcoholic drinks they had consumed during the last seven days, and (iv) how many times, if ever, they had used marijuana/cannabis, hallucinogens, meth/amphetamines, cocaine, heroin, or ecstasy in their lifetime.

Parent/friend smoking behaviour

Students reported whether their (i) mother/primary caregiver 1 and (ii) father/primary caregiver 2 smoked and how many of their five closest friends smoke. Binary variables were created to identify students with at least one parent/carer who smokes and at least one close friend who smokes, respectively.

Smoking attitudes

Students were asked to indicate how much danger they would see for themselves in 'smoking one or two cigarettes occasionally' (*not dangerous*, *a little dangerous*, *very dangerous*, *don't know*) and their level of agreement that 'smokers are usually more popular than non-smokers' (*strongly disagree*, *disagree*, *agree*, *strongly agree*, *don't know*). Responses were subsequently collapsed into those who perceived no personal danger (not dangerous vs. all other responses) and those who agreed (strongly agreed/agreed vs. all other responses).

Statistical analysis

Data were analysed using Stata SE 16.1 (StataCorp, College Station, Texas), and the total Victorian sample (n=4,266) was weighted to align with population distributions of 12- to 17-year-old students in Victoria by sex, age, and education sector.⁴² Descriptive statistics were used to characterise the study sample and report the proportion of students who were susceptible to smoking. A series of initial logistic regression models were conducted to examine the association between smoking susceptibility and each factor assessed (i.e. one predictor per model). Those factors significantly associated with smoking susceptibility ($p < 0.05$) in these initial models were included in a final multivariable logistic regression model to identify the

strongest independent predictors, adjusting for education sector and school-level clustering.

Results

Of the 3,468 students included in the study sample (unweighted $n=3,410$), there were approximately equal proportions of male and female students. The average age of participants was 14.2 years ($SE=0.2$). Over three-quarters of students resided in either a low (36%) or mid (42%) socio-economic area, and around 7 in 10 lived in a metropolitan location. A summary of the demographic profile of the study sample, along with population comparisons (where available), is presented in Table 1. Proportions for the other factors assessed are shown in Supplementary file 1.

Overall, 11% (95% confidence interval [CI]: 9.6–12.6) of students who had never smoked were classified as being susceptible to smoking. As shown in Table 2, 13 of the 18 factors assessed were significantly associated with smoking susceptibility in the initial models, with no association found for sex, socio-economic area, geographic location, Aboriginal and/or Torres Strait Islander status, school ability, and parent smoking. In the multivariable model, the predictive effects for eight factors—age, weekly income/allowance, mental health diagnosis, school ability, school absenteeism, shisha tobacco/hookah/waterpipe use, past week drinking and illicit drug use—were no longer statistically significant. However, five factors were found to be independently associated with smoking susceptibility including ever use of e-cigarettes (adjusted odds ratio [AOR]=3.26, 95% CI: 1.83–5.81, $p<0.001$), perceiving smokers to be more popular than non-smokers (AOR=2.87, 95% CI: 1.62–5.10, $p=0.001$), having at least one close friend who smokes (AOR=2.66, 95% CI: 1.61–4.40, $p<0.001$), perceiving smoking one or two cigarettes occasionally as not dangerous (AOR=2.56, 95% CI: 1.61–4.09, $p<0.001$) and having symptoms of depression (AOR=1.59, 95% CI: 1.06–2.38, $p=0.026$).

Discussion

Overall, we found that about one in 10 Australian secondary students who had never smoked were susceptible to smoking. The strongest smoking initiation risk factor identified was ever use of e-cigarettes. Other factors found to be independently associated with smoking susceptibility centred around social norms, harm misperceptions of occasional tobacco use, and poor mental health.

Adolescents who had never smoked but who had tried e-cigarettes had more than three times greater odds of being susceptible to smoking, even after controlling for many potential confounders. Although past week drinkers of alcohol and ever users of illicit drugs or other tobacco products were more likely to be susceptible to smoking in bivariate analyses, these relationships became non-significant after controlling for other risk factors. In line with recent US research,¹⁸ these findings suggest e-cigarette use may share a unique relationship with smoking susceptibility and onset. With the rapidly growing use of e-cigarettes (and evidence of a concurrent increase in smoking rates) among young Australians,^{2,3,29} and prior research showing an association between e-cigarette use and smoking even among adolescents not susceptible to smoking,³⁰ there is an urgent need for strong regulations that reduce e-cigarette use among youth.

For example, in November 2022, the Australian Minister for Health and Aged Care announced plans to update tobacco advertising regulations to encompass e-cigarettes.⁴³ Additional measures to tackle e-cigarette usage were also announced by the Minister in May 2023, including reducing the attractiveness of vaping products to teenagers by banning flavours and single-use vapes, introducing plain, pharmaceutical-like packaging, and ending the importation and sale of vaping products outside the medical (prescription-only) access model.⁴⁴ Currently, non-nicotine e-cigarettes may be sold by Australian retailers to people over 18 years in most states and territories; however, sales to minors are rampant, and many of the products contain nicotine.⁴⁵

Social norms and the smoking behaviour of peers are consistent predictors of smoking susceptibility and uptake,^{4,46} with adolescents particularly vulnerable to social influences and the desire to fit in.⁴⁷ Consistent with these findings, our results showed that adolescents who had never smoked who have friends who smoke or that associate smoking with popularity are at greater risk for smoking initiation. Despite the decreasing social acceptability of smoking,⁴⁸ about seven per cent of those who had never smoked in our study perceived those who smoke as more popular, and about one in seven reported having at least one close friend who smokes. Anti-smoking campaigns and prevention strategies may benefit by using messaging that refers to close friends (rather than more general peer groups) or that is culturally tailored.⁴⁷ Although others have found parental smoking predicts smoking susceptibility,¹⁹ in line with recent European research,¹⁵ our study found no such relationship. This may be due to a range of protective factors that can promote the development of anti-smoking norms among children whose parents smoke, including smoking bans in the home, effective communication, and child monitoring and discipline.⁴⁹

Perceptions that occasional smoking is not personally dangerous were also associated with more than double the odds of smoking susceptibility. Exposure to nicotine during adolescence can lead to rapid addiction and harm the developing brain,⁵⁰ and occasional or 'social' smoking substantially increases a person's risk of disease and death.⁵¹ However, adolescents often underestimate the health effects and addictiveness of smoking.¹⁰ Public health messaging that highlights these risks may help to correct misperceptions among smoking-susceptible youth regarding the harmfulness and addictiveness of occasional smoking and reduce their likelihood of smoking experimentation and progression.

Finally, the present study also adds to the evidence on the association between smoking and mental illness^{2,52,53} by showing that adolescents with elevated depression symptomatology are more susceptible to smoking uptake. In Australia, adolescents² and adults⁵⁴ with mental illness are substantially more likely to smoke than those without, and the present findings suggest that the early diagnosis and treatment of mental disorders among youth may help to reduce some of these disparities. More than one in five adolescents who had never smoked met the criteria for depression in the present study, hence addressing mental health concerns and reducing the risk of smoking uptake among this group has significant potential to reduce smoking prevalence among Australian adolescents. This may be particularly important in the wake of COVID-19, whereby experiences of isolation, boredom, stress, and worsened mental health among adolescents

Table 2: Results from logistic regression analyses predicting smoking susceptibility among 12- to 17-year-old secondary students.

Factor	Bivariate analyses		Multivariable model (n=2,314)	
	OR (95% CI)	p-value	AOR (95% CI)	p-value
Sex				
Male	Ref			
Female	1.14 (0.90-1.46)	0.278		
Age (years)				
12	Ref		Ref	
13	1.59 (0.93-2.72)	0.090	0.87 (0.49-1.55)	0.628
14	2.34 (1.40-3.92)	0.002	1.40 (0.77-2.53)	0.264
15	2.86 (1.73-4.74)	<0.001	1.26 (0.75-2.13)	0.368
16	3.31 (1.82-6.01)	<0.001	1.39 (0.77-2.50)	0.271
17	2.81 (1.55-5.10)	0.001	0.94 (0.48-1.86)	0.865
Socio-economic area				
Low (1-40%)	Ref			
Mid (41-80%)	0.96 (0.75-1.23)	0.751		
High (81-100%)	1.24 (0.89-1.73)	0.199		
Geographic location				
Metropolitan	Ref			
Regional/rural	0.98 (0.71-1.34)	0.875		
Aboriginal and/or Torres Strait Islander				
No	Ref			
Yes	1.06 (0.48-2.34)	0.885		
Weekly income/allowance				
None	Ref		Ref	
\$1 to \$40	1.77 (1.15-2.72)	0.010	1.62 (0.99-2.66)	0.054
\$41 to \$80	2.68 (1.50-4.79)	0.001	1.61 (0.87-2.98)	0.127
\$81 or more	2.72 (1.77-4.18)	<0.001	1.98 (0.95-4.16)	0.069
Mental health diagnosis				
No/Don't know/Not sure	Ref		Ref	
Yes	1.95 (1.33-2.85)	0.001	0.91 (0.56-1.47)	0.689
SMFQ score 12 or more				
No	Ref		Ref	
Yes	1.83 (1.35-2.48)	<0.001	1.59 (1.06-2.38)	0.026
School ability				
A lot above average/above average	0.72 (0.50-1.01)	0.059	0.72 (0.41-1.28)	0.256
Average	Ref		Ref	
Below average/a lot below average	1.61 (1.12-2.31)	0.011	1.67 (0.99-2.83)	0.055
At school on the last school day				
No	1.96 (1.45-2.64)	<0.001	1.18 (0.68-2.05)	0.550
Yes	Ref		Ref	
Ever used e-cigarettes				
No	Ref		Ref	
Yes	3.46 (2.52-4.76)	<0.001	3.26 (1.83-5.81)	<0.001
Ever used shisha tobacco/hookah/waterpipe				
No	Ref		Ref	
Yes	3.47 (2.55-4.71)	<0.001	1.65 (0.80-3.44)	0.174
Current (past week) drinker				
No	Ref		Ref	
Yes	2.11 (1.50-2.98)	<0.001	1.55 (0.94-2.58)	0.087
Ever used illicit drugs^a				
No	Ref		Ref	
Yes	2.57 (1.72-3.83)	<0.001	0.98 (0.56-1.72)	0.943
At least one parent smokes				
No	Ref			
Yes	1.04 (0.79-1.36)	0.799		
At least one close friend smokes				
No	Ref		Ref	
Yes	4.09 (2.88-5.81)	<0.001	2.66 (1.61-4.40)	<0.001

(continued)

Factor	Bivariate analyses		Multivariable model (n=2,314)	
	OR (95% CI)	p-value	AOR (95% CI)	p-value
Danger you would see for yourself in smoking one or two cigarettes occasionally				
Not dangerous	3.02 (2.25-4.05)	<0.001	2.56 (1.61-4.09)	<0.001
A little dangerous/very dangerous/don't know	Ref		Ref	
Smokers are usually more popular than non-smokers				
Agree/strongly agree	3.04 (1.99-4.65)	<0.001	2.87 (1.62-5.10)	0.001
Disagree/strongly disagree/don't know	Ref		Ref	

Notes: Bolded results are statistically significant at $p < 0.05$. AORs are adjusted for all significant predictors in bivariate analyses, education sector and school-level clustering.

OR = odds ratio; AOR = adjusted odds ratio; CI = confidence interval; Ref = reference category; SMFQ = Short Mood and Feelings Questionnaire.

^aIncludes cannabis, hallucinogens, amphetamines, ecstasy, cocaine and opiates.

may have increased the risk of tobacco/nicotine and other substance use.^{55,56}

Limitations

As this was a cross-sectional study, we are unable to draw any causal inferences about the observed associations. Also, the use of a self-report survey may lead to some recall or social desirability bias. However, studies conducted on school premises (i.e. without parents present) have been shown to report more accurate estimates of smoking, compared to surveys administered in the home, which may help to reduce some of these social biases.⁵⁷ A further limitation was the low school response rate (13%), which reflects the ongoing challenges in obtaining access to schools to survey students. The use of replacement schools with similar characteristics to the originally selected schools did, to some extent, help preserve the representativeness of the sample and minimise the risk of non-response bias. We acknowledge that using a single-item question to measure smoking susceptibility, instead of the three-item construct proposed by Pierce et al.,¹² may have resulted in an underestimated proportion of susceptible students. However, recent studies that measured smoking susceptibility using a single-item found their measures predict tobacco product uptake.^{23,37} Given the survey length constraints many school-based studies face, future research comparing the relative validity of single-item measures of smoking susceptibility against Pierce's three-item construct would be beneficial. It is also important to acknowledge that, due to survey length constraints, our study did not consider all factors that have previously been found to be associated with smoking susceptibility among adolescents who have never smoked (e.g. exposure to tobacco advertising and promotion).^{19,21-24} Finally, we note this study used data collected in 2017, which is the most recent school data available in Australia due to COVID-related postponements to the scheduled 2020 ASSAD survey round.

Strengths of this study include the large sample size, representation across a broad population of students, and the considerable number of factors we were able to examine (18 in total). It is also, to our knowledge, the first Australian study to examine risk factors for smoking susceptibility among adolescents who have never smoked.

Conclusions

This study identifies several independent risk factors for smoking initiation in young Australians that could be used to inform the

development and targeting of prevention policies and programs. Specifically, the strength of the relationship between e-cigarette use and smoking susceptibility highlights the need for strong regulations that reduce promotion and access to e-cigarettes by adolescents. Strategies to correct social norms and harm misperceptions around occasional tobacco use, and interventions addressing mental health, may also help to prevent future smoking uptake among Australian adolescents.

Funding

This study was funded by the Australian Government Department of Health and Aged Care, the Victorian Department of Health and Human Services, and Cancer Council Victoria.

Ethics approval

The project received ethical approval from Cancer Council Victoria's Human Research Ethics Committee (HREC 1013).

Authorship

All authors have contributed to the present paper by being involved in conceiving and designing the study or in analysis and interpretation of data, and in writing and revising the paper.

Acknowledgements

We gratefully acknowledge the government and non-government education authorities, the school principals, teachers and students who cooperated to make this study possible. We also thank the research staff for assistance with data collection.

Conflicts of interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Victoria White reports financial support was provided by the Australian Government Department of Health and Aged Care and the Victorian Department of Health and Human Services. All authors are employed by (MS, EG, EB, MW, SD), or hold an honorary position with (VW), a non-profit organisation that conducts public health intervention, research and advocacy aimed at reducing the harms of tobacco in the community.

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Appendix A Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.anzjph.2023.100076>.