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Cigarette smoking among university students aged 18–24 years in New Zealand: results of the first (baseline) of two national surveys

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ABSTRACT

Objectives Although the smoking prevalence continues to decline in New Zealand (NZ) overall, little is known about smoking in university students. A 2013 survey of students aged 17–25 years found that 14% were current smokers, and 3% daily smokers. However, the sample did not include students from all NZ universities. This study examines the prevalence and patterns of cigarette smoking among students aged 18–24 years.

Setting University students across NZ.

Methods Data came from a March to May 2018 survey of students from all NZ universities, and were weighted to account for undersampling and oversampling, based on gender and university size. χ^2 tests were used to compare smoking by age, gender and ethnicity.

Participants 1476 participants were included: 919 (62.3%) aged 18–20 years and 557 (37.7%) aged 21–24 years; 569 (38.6%) male and 907 (61.4%) female; and 117 (7.9%) Māori and 1359 (92.1%) non-Māori.

Results 49.8% (95% CI 47.2 to 52.4) of respondents reported ever smoking, 11.1% (95% CI 9.5 to 12.9) currently smoked (smoked at least once a month) and 5.9% (95% CI 4.8 to 7.3) smoked at least daily (daily smokers). Of current smokers, 63.6% smoked 1–5 cigarettes/day, 45.8% smoked daily, 73.4% smoked first cigarette >60 min after waking, 86.0% never/almost never smoked in indoor and 64.6% in outdoor smokefree spaces, 69.9% planned to quit and 32.4% had tried to quit. Ever, current and daily smoking were significantly higher in 21–24 compared with 18–20 years olds, and in males compared with females. Older participants were more likely to report smoking more cigarettes/day. Māori were more likely to report ever smoking than non-Māori.

Conclusions Current smoking among NZ university students aged 18–24 years appears to be declining but daily smoking could be increasing. However, many students appeared less addicted to nicotine, and willing to quit. We recommend increasing the availability of smokefree services for students who wish to quit.

Strengths and limitations of this study

- This is the first study in NZ to examine the prevalence of cigarette smoking, and patterns of smoking in a sample of university students across the country.
- The sample was weighted by gender and university size to improve its representation of the general NZ university student population.
- The main limitation of this study is that sampling was not random.

INTRODUCTION

Tobacco continues to be a leading cause of preventable morbidity and mortality in Aotearoa New Zealand (New Zealand or NZ), with an estimated 5000 deaths each year linked to smoking.[1] Smoking is a major contributor to health inequalities in NZ, with mortality rates among Māori, the Indigenous population of NZ, roughly two times those of non-Māori non-Pacific people (mainly NZ European).[2] Monitoring smoking behaviours is vital to inform tobacco control policies to reduce preventable deaths and morbidity, and to reduce inequalities.

In March 2011, the NZ government adopted the Smokefree Aotearoa 2025 goal (Smokefree 2025 or Smokefree goal) for NZ, in response to the recommendations of a landmark parliamentary inquiry by the Māori Affairs Select Committee into the tobacco industry in Aotearoa and the consequences of tobacco use for Māori.[3] The goal aspires to reduce the prevalence of smoking and tobacco availability to minimal levels (5% or less) by the year 2025.[3] The government has maintained a 10% tax increase (above inflation) on tobacco products (effected on 1st January) annually since 2010,[4] among other measures to reduce smoking.[5]

Despite an overall decline in the prevalence of smoking, with current smoking reducing from 18.2% in 2011/2012 to 14.9% in 2017/2018 and daily smoking from 16.3% to 13.1% in the same period,[6] the prevalence remains high in people aged 18–24 years

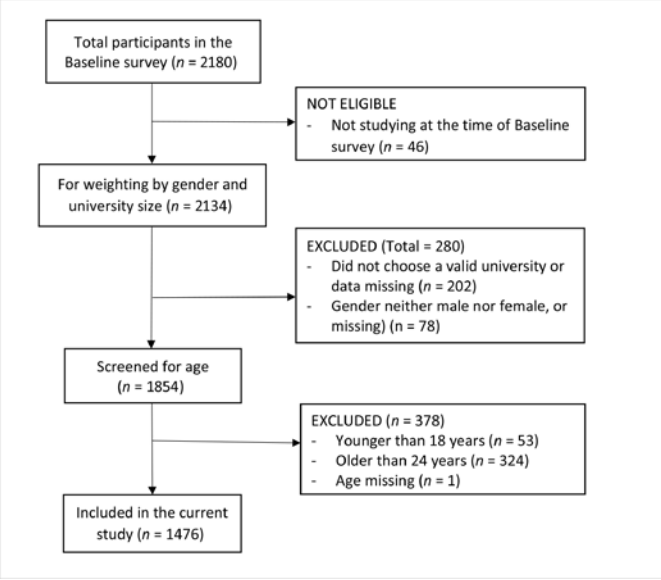

Figure 1 Flow chart of selection of participants included in this study.

(20%), 25–34 years (22%), Pasifika peoples (23%) and Māori (34%), compared with the general population.[6]

There is limited information on smoking among university students in NZ currently. A 2013 survey that estimated the prevalence of daily and occasional smoking among university students aged 17–25 years from five NZ universities reported that 14% of participants smoked occasionally and 3% smoked on a daily basis.[7] These estimates were much lower than those in the wider population within the same age group.[8] A previous survey of University of Otago students in 2002 found that 10% of respondents smoked daily and a further 10% reported occasional smoking.[9] These estimates were likewise much lower than estimates of smoking prevalence among people in the same age group in the general population at the time, which ranged between 18.8%–26.8% in 15–19 years olds and 29.8%–30.3% in 20–24 years olds.[10]

University students experience fundamental changes in social contexts and identity, as they transition to life away from home (most but not all) and make new friends at university.[11 12] Greater independence and new peers may promote smoking among occasional smokers, and increase progression to daily smoking.[12] This study sought to estimate the prevalence and patterns of smoking among university students aged 18–24 years in a national university student population.

METHODS

We analysed data from the first of two surveys (the 'Baseline survey'), a cross-sectional survey conducted between March and May 2018 as part of the corresponding author's PhD thesis project. The survey collected data on the perceptions of university students in NZ on vaping, cigarette smoking and the Smokefree 2025 goal. This paper concentrates on the data on smoking.

The Baseline survey aimed to recruit a minimum of 1062 students from all eight NZ universities: 902 domestic and 160 international, using multiple approaches, to increase the participation of Māori and Pasifika students. Sample size calculations were based on the 2016 Universities NZ data,[13] which showed the total NZ university students at 172 000, 85% of whom were domestic (11% Māori, 7.8% Pasifika and 81.2% non-Māori non-Pasifika) and 15% international students; a CI of 95%; estimated smoking proportion of 0.5 (conservative estimate); margin of error of 3%; and estimated response rate of 10%. A total of 10 610 students were to be invited, but far more were reached.

Random sampling was not feasible, because complete enrolment lists of students were not available from the universities. However, data were weighted to account for undersampling and oversampling, by gender (male and female) and institution size. Furthermore, the questionnaire comprised both an online and printed version and was distributed widely, using social media and other forms of advertising, and direct contact with student volunteers. A total of 2180 students participated in the Baseline survey and 1476 met the criteria for inclusion in the current study (ie, they were studying at an NZ university and were aged 18–24 years). Figure 1 describes how the participants were selected.

The survey

In the online route, the project was advertised on students' association Facebook pages at respective universities, where this was possible, using a single advert message and photograph. In addition to adverts in general students' association social media platforms, further engagements were made with Māori and Pasifika students' associations. Printed questionnaires were distributed by research assistants (RAs) and volunteers, from participating universities. RAs were recruited from Student Job Search, a charitable organisation formed by student associations in NZ to help current students and recent graduates of tertiary education institutions in NZ find work.[14]

The questionnaire used validated questions: the ethnicity question was based on the NZ census,[15] ever smoking question on the NZ Tobacco Use Survey (NZTUS),[16] frequency of smoking question was adapted from Marsh *et al*, who looked at the association of smoking with drinking in NZ university students,[7] and NZTUS,[16] cigarettes/day question from the Fagerstrom Test for Nicotine Dependence (FTND) questionnaire,[17] time to first cigarette question from NZTUS[16] and FTND,[17] and quit intentions from NZTUS.[16] Questions on current smoking, smoking in smokefree spaces and number of quit attempts were developed in-house. We piloted the questionnaire and survey methods on 22 students at the University of Canterbury (UC) in October 2017. Respondents were contacted using the approaches described previously.

Patient and public involvement

No patients were involved in this project.

Survey measures

Responses to two sections, demographic information and tobacco use, out of four sections asked in the Baseline survey are relevant to this paper and are explained below. For the benefit of the reader, a brief description of items on vaping (ever, current and daily vaping) is also provided.

Demographic information

Respondents provided information on age, gender, ethnicity, years lived in NZ and the university where they were studying. Only those aged 18–24 years were included in the analysis because this allowed for comparisons with national estimates that use a similar age band.[6] Gender-specific analyses included only participants who identified as male or female due to extremely small numbers of other genders. Ethnicity-specific analyses compared Māori and non-Māori, as in previous studies.[9 18 19] Years lived in NZ (five or less) was used as a proxy for international students. Participants could select one or more of the eight universities: Auckland University of Technology, Lincoln University, Massey University, University of Auckland, UC, University of Otago, University of Waikato and Victoria University of Wellington.

Tobacco use

Respondents were asked 'Have you smoked cigarettes or tobacco at all, even just a few puffs?', and responses were: 'Yes' and 'No'. Those who answered 'Yes' (defined as 'ever smokers') were asked 'Do you currently smoke cigarettes or tobacco? This includes roll-your-own', and responses were: 'Yes' and 'No'. Those who answered 'Yes' were asked 'Which of the following best describes how often you smoke cigarettes or tobacco now?', and responses were: 'At least once a day', 'At least once a week', 'At least once a month' and 'Less often than once a month'. Those who smoked at least once a day were defined as 'daily smokers', and those who smoked at least once a month or more frequently were defined as 'current smokers'.

Current smokers were further asked 'During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?', and responses were: '1–5', '6–10', '11–20', '21–30', '31 or more' and 'Don't know'. A new variable was created with just two responses as '1–5 cigarettes' and '>5 cigarettes'.

Time to smoking the first cigarette was asked using the question 'How soon after waking do you smoke your first cigarette?', and responses were: 'Within 5 min', '5–30 min', '31–60 min' and '>60 min'. A new variable with only two levels, 'within 60 min' and '>60 min', was created. This was due to small numbers in the three response categories that fell within 60 min of waking. This variable was only used in overall prevalence analyses, not for analyses by age, gender or ethnicity.

Smoking in spaces where smoking is banned was assessed by 'How often do you smoke in the following settings…? (1) In indoor spaces where smoking is banned and (2) in outdoor spaces where smoking is banned', and responses for both were: 'Never', 'Almost never', 'Sometimes', 'Fairly often' and 'Very often'. A new variable was created combining those who said 'Never' and 'Almost never' into 'Never/almost never' and the rest grouped together into 'Other'. This was due to small numbers of those who said sometimes, fairly or very often. This

Table 1 Demographic characteristics of participants

Variable	Sample (n=1476) (%)
Age, years	
18–20	919 (62.3)
21–24	557 (37.7)
Gender	
Male	569 (38.6)
Female	907 (61.4)
Ethnicity	
NZ European	830 (56.2)
Māori	117 (7.9)
Samoan	62 (4.2)
Cook Island Māori	16 (1.1)
Tongan	26 (1.8)
Niuean	5 (0.3)
Chinese	224 (15.2)
Indian	79 (5.4)
Other	327 (22.2)
Years lived in NZ	
Less than 1	139 (9.4)
1–5	168 (11.4)
6–10	99 (6.7)
More than 10	1065 (72.2)
Missing data	5 (0.3)
University	
AUT*	59 (4.0)
Lincoln University	64 (4.3)
Massey University	165 (11.2)
University of Auckland	306 (20.7)
University of Canterbury	243 (16.5)
University of Otago	258 (17.5)
University of Waikato	142 (9.6)
VUW†	246 (16.7)

This table presents unweighted data. Respondents could select one or more universities.
*Auckland University of Technology.
†Victoria University of Wellington.
NZ, New Zealand.

variable was only used in overall prevalence analyses, not for analyses by age, gender or ethnicity.

The first question on quitting asked 'Are you planning on giving up smoking?', and responses were: 'Yes, within 30 days', 'Yes, after 30 days but within 3 months', 'Yes, but not within the next 3 months' and 'No, I am not planning on giving up'. A new variable was created with only two levels: 'Yes, I plan to quit' (included all who said planned to quit, regardless of the timeline) and 'Not planning to quit'. The second question on quitting asked 'Have you tried to quit smoking at any time in the last 12 months?', and responses were: 'Yes' and 'No'.

Those who had tried to quit were asked 'In the last 12 months, how many serious attempts to stop smoking did you make that lasted 24 hours or longer? Please include any attempts that you are currently making.', and responses were: '1–3', '4–5' and 'More than 5'. Because of small numbers of those who reported making '4–5' or 'More than 5' attempts, these were combined, resulting in just two groups: '1–3 attempts' and '>3 attempts'. This variable was only used in overall prevalence analyses, not for analyses by age, gender or ethnicity.

Electronic cigarette use (vaping)

'Ever vaper' refers to those who said 'Yes' in response to the question 'Have you ever tried an e-cigarette or vaping device?', 'current vaper' refers to those who reported vaping at least once a month or more frequently in response to the question 'How often do you currently use an e-cigarette or vaping device?', while 'daily vaper' refers to those who reported vaping at least once daily.

Data analysis

χ^2 tests were used to compare smoking prevalence by age (18–20 vs 21–24 years), gender (male vs female) and ethnicity (Māori vs non-Māori). All statistical analyses were performed using IBM SPSS Statistic V.25 and two-sided p<0.05 was considered statistically significant. CIs were included where appropriate. Responses were weighted to account for undersampling and oversampling, based on gender and institution size. Inconsistent reporting of summary data across universities meant that weights to account for undersampling and oversampling with respect to age and ethnicity could not be calculated.

RESULTS

Demographic characteristics of the sample (unweighted) are reported in table 1. A total of 56.2% identified as NZ European, 7.9% as Māori, 7.4% as Pasifika (in this study, Pasifika included Samoan, Cook Island Māori, Tongan and Niuean), 15.2% as Chinese, 5.4% as Indian and 22.2% as 'Other'. The total percentage exceeds 100% because, as in the NZ census, respondents could select as many ethnic groups as applied. Table 2 compares characteristics of students who participated in this study (domestic or international, ethnicity and gender) with the general NZ university student population.

Table 2 Demographic characteristics of students who participated in this study versus NZ university student population

		This paper		NZ university student population (%)*
		Unweighted (%)	Weighted (%)	
Student type	Domestic	79.1	77.5	82.0
	International	20.9	22.5	18.0
Ethnicity	Māori	7.9	6.9	9.6
	Non-Māori	92.1	93.1	90.4
Gender	Male	38.6	40.8	41.8
	Female	61.4	59.2	58.2

*Source: Ministry of Education.[30] Data extracted from Excel sheets ENR.31, ENR.32 and ENR.34.
NZ, New Zealand.

Overall smoking

A total of 49.8% (95% CI 47.2 to 52.4) of respondents reported ever smoking, 11.1% (95% CI 9.5 to 12.9) currently smoked and 5.9% (95% CI 4.8 to 7.3) smoked daily (table 3). Of current smokers, 63.6% smoked 1–5 cigarettes/day, 20.8% smoked 6–10, 10.5% smoked 11–20 and 5.1% smoked 21 or more; and 45.8% smoked at least daily, 20.9% at least once a week, 18.9% at least once a month and 14.4% less often than once a month. A total of 17.3% of smokers smoked their first cigarette within 30 min of waking, 9.3% within 31–60 min and 73.4% after more than 60 min; 86.0% reported never or almost never smoking in indoor and 64.6% in outdoor spaces where smoking is banned; 69.9% planned to quit; and 32.4% reported trying to quit in the last 12 months, and 71.7% of those had made 1–3 serious attempts to quit smoking.

Smoking by age

Statistically significantly more participants aged 21–24 years reported ever (55.6% vs 46.3%, p=0.001), current (15.0% vs 8.7%, p<0.001) and daily smoking (9.8% vs 3.6%, p<0.001), and smoking>5 cigarettes/day (45.0% vs 27.4%, p=0.019) than those aged 18–20 years, but quit intentions were not statistically significantly different (32.6% vs 31.9%, p=0.919) (table 3).

Smoking by gender

Gender-specific analyses included only males and females. Ever (59.8% vs 43.0%, p<0.001), current (16.6% vs 7.3%, p<0.001) and daily smoking (10.0% vs 3.1%, p<0.001) were statistically significantly higher in males compared with females, but smoking>5 cigarettes/day (40.8% vs 28.8%, p=0.115) and quit intentions (29.1% vs 37.7%, p=0.219) were not statistically significantly different (table 4).

Smoking by ethnicity

Ever smoking (75.2% vs 48.0%, p<0.001) was statistically significantly higher in Māori than in non-Māori, but current smoking (14.0% vs 10.9%, p=0.342), daily smoking

Table 3 Ever, current, regular and at least once daily smoking, number of cigarettes/day and quit intentions, by age group

		18–20 years	21–24 years	Total	P value
Ever smoked?	Yes	414 (46.3)	308 (55.6)	722 (49.9)	0.001
	No	480 (53.7)	246 (44.4)	726 (50.1)	
	Total	**894 (100.0)**	**554 (100.0)**	**1448 (100.0)**	
Currently smoke?	Yes	78 (8.7)	83 (15.0)	161 (11.1)	<0.001
	No	817 (91.3)	471 (85.0)	1288 (88.9)	
	Total	**895 (100.0)**	**554 (100.0)**	**1449 (100.0)**	
Smokes daily?	Yes	32 (3.6)	54 (9.8)	86 (5.9)	<0.001
	No	863 (96.4)	499 (90.2)	1362 (94.1)	
	Total	**895 (100.0)**	**553 (100.0)**	**1448 (100.0)**	
Number of cigarettes/day	1–5 cigarettes	61 (72.6)	44 (55.0)	105 (64.0)	0.019
	>5 cigarettes	23 (27.4)	36 (45.0)	59 (36.0)	
	Total	**84 (100.0)**	**80 (100.0)**	**164 (100.0)**	
Ever tried to quit	Yes	30 (31.9)	30 (32.6)	60 (32.3)	0.919
	No	64 (68.1)	62 (67.4)	126 (67.7)	
	Total	**94 (100.0)**	**92 (100.0)**	**186 (100.0)**	

The cells contain rounded weighted counts and sometimes the marginal totals are not exactly the sum of the component cells. Ever, current and daily smoking questions were answered by the entire sample. Cigarettes/day and quit intentions questions were answered by both current smokers (smoking at least once a month) and those who smoked less frequently than once a month.
Bold values reflect the totals which vary based on the sample to whom the question applied. The first 3 items applied to the entire sample while the 4th and 5th items applied to a sub-group of the sample.

(6.0% vs 5.9%, p=0.979), smoking>5 cigarettes/day (31.3% vs 36.9%, p=0.655) and quit intentions (41.2% vs 31.4%, p=0.409) were all not statistically significantly different between Māori and non-Māori (table 5).

Vaping prevalence

39.8% of the sample reported ever vaping, 6.0% currently vaped (vaped at least once a month) and 1.6% vaped at

Table 4 Ever, current, regular and at least once daily smoking, number of cigarettes/day and quit intentions, by gender

		Male	Female	Total	P value
Ever smoked?	Yes	353 (59.8)	368 (43.0)	721 (49.9)	<0.001
	No	237 (40.2)	488 (57.0)	725 (50.1)	
	Total	**590 (100.0)**	**856 (100.0)**	**1446 (100.0)**	
Currently smoke?	Yes	98 (16.6)	63 (7.3)	161 (11.1)	<0.001
	No	492 (83.4)	796 (92.7)	1288 (88.9)	
	Total	**590 (100.0)**	**859 (100.0)**	**1449 (100.0)**	
Smokes daily?	Yes	59 (10.0)	27 (3.1)	86 (5.9)	<0.001
	No	532 (90.0)	831 (96.9)	1363 (94.1)	
	Total	**591 (100.0)**	**858 (100.0)**	**1449 (100.0)**	
Number of cigarettes/day	1–5 cigarettes	58 (59.2)	47 (71.2)	105 (64.0)	0.115
	>5 cigarettes	40 (40.8)	19 (28.8)	59 (36.0)	
	Total	**98 (100.0)**	**66 (100.0)**	**164 (100.0)**	
Ever tried to quit	Yes	32 (29.1)	29 (37.7)	61 (32.6)	0.219
	No	78 (70.9)	48 (62.3)	126 (67.4)	
	Total	**110 (100.0)**	**77 (100.0)**	**187 (100.0)**	

The cells contain rounded weighted counts and sometimes the marginal totals are not exactly the sum of the component cells. Ever, current and daily smoking questions were answered by the entire sample. Cigarettes/day and quit intentions questions were answered by both current smokers (smoking at least once a month) and those who smoked less frequently than once a month.
Bold values reflect the totals which vary based on the sample to whom the question applied. The first 3 items applied to the entire sample while the 4th and 5th items applied to a sub-group of the sample.

Table 5 Ever, current, regular and at least once daily smoking, number of cigarettes/day and quit intentions, by ethnicity

		Māori	Non-Māori	Total	P value
Ever smoked?	Yes	76 (75.2)	646 (48.0)	722 (49.9)	<0.001
	No	25 (24.8)	701 (52.0)	726 (50.1)	
	Total	**101 (100.0)**	**1347 (100.0)**	**1448 (100.0)**	
Currently smoke?	Yes	14 (14.0)	147 (10.9)	161 (11.1)	0.342
	No	86 (86.0)	1201 (89.1)	1287 (88.9)	
	Total	**100 (100.0)**	**1348 (100.0)**	**1448 (100.0)**	
Smokes daily?	Yes	6 (6.0)	80 (5.9)	86 (5.9)	0.979
	No	94 (94.0)	1268 (94.1)	1362 (94.1)	
	Total	**100 (100.0)**	**1348 (100.0)**	**1448 (100.0)**	
Number of cigarettes/day	1–5 cigarettes	11 (68.8)	94 (63.1)	105 (63.6)	0.655
	>5 cigarettes	5 (31.3)	55 (36.9)	60 (36.4)	
	Total	**16 (100.0)**	**149 (100.0)**	**165 (100.0)**	
Ever tried to quit	Yes	7 (41.2)	53 (31.4)	60 (32.3)	0.409
	No	10 (58.8)	116 (68.6)	126 (67.7)	
	Total	**17 (100.0)**	**169 (100.0)**	**186 (100.0)**	

The cells contain rounded weighted counts and sometimes the marginal totals are not exactly the sum of the component cells. Ever, current and daily smoking questions were answered by the entire sample. Cigarettes/day and quit intentions questions were answered by both current smokers (smoking at least once a month) and those who smoked less frequently than once a month.
Bold values reflect the totals which vary based on the sample to whom the question applied. The first 3 items applied to the entire sample while the 4th and 5th items applied to a sub-group of the sample.

least daily. Detailed data on vaping are under consideration in a separate paper.

DISCUSSION

This study estimates, in an NZ university student population, the prevalence of current smoking (at least once a month or more frequently) of 11.1% and daily smoking of 5.9%. It also reports higher ever, current and daily smoking estimates in students aged 21–24 years compared with those aged 18–20 years and in males compared with females, and higher ever smoking estimates in Māori compared with non-Māori students.

The two main limitations of the study lay in its inability to access vital information from universities to facilitate random sampling, and under-representation of some universities (fewer participants relative to university size); data weighting was done to address the latter. Volunteer bias could lead to underestimation or overestimation of prevalence estimates while affecting to a minor extent the associations between smoking and age, gender and ethnicity.

Our estimates are low compared with the national smoking prevalence estimates in the same age group.[6] Comparison with results of a previous study by Marsh *et al*,[7] which looked at smoking in a sample of students aged 17–25 years from five universities using 2013 data, suggests that the prevalence of current smoking among students decreased marginally from 14.1% in 2013 to 11.1% in 2018, while daily smoking increased slightly from 2.9% to 5.9% in the same period. However, important differences exist in demographic characteristics of participants in these two surveys: there were more Pasifika students (7.4% vs 4.0%), slightly fewer NZ European students (56.2% vs 62.3%), more international students (20.8% vs 8.7%) and slightly different age bands (18–24 vs 17–25 years) in the current study compared with Marsh *et al*.[7] Students who had lived in NZ for 5 years or less are used as a proxy for international students in the current study. Our daily smoking prevalence estimate of 5.9% is, nevertheless, lower than the 10% reported in a 2002 survey of students at Otago.[9]

NZ is currently at stage 4 of the smoking epidemic characterised by a marked downturn in smoking prevalence in both men and women.[20 21] The prevalence of smoking is generally higher in Māori and Pasifika than in non-Māori non-Pasifika,[6] and a large proportion of international students in NZ come from countries with traditionally high smoking prevalence.[22] Combined, these could have a substantial contribution to observed prevalence estimates. It is also possible that students may have reduced the number of cigarettes/day without quitting entirely, due to increasing cost of cigarettes[23] as a result of annual cigarette tax increase[4]; about 64% of current smokers in our study smoked 1–5 cigarettes/day. Most NZ universities also have smokefree campuses.

Smoking prevalence among male compared with female students was of particular concern, with ever smoking 59.8% vs 43.0%, current smoking 16.6% vs 7.3% and daily smoking 10.0% vs 3.1%. One possibility might be that males are more likely to have many smoking peers. A European study that looked at predictors of smoking behaviour of first-year university students in Turkey found

that only 5% of students whose best friends were non-smokers were themselves smokers, while about 50% of those whose three best friends smoked were also regular smokers.[24] Another possibility is that males are more likely to live away from home than females. Living with parents or boarding was found to be protective against smoking in a previous study.[7]

Many current smokers, however, smoked five or fewer cigarettes/day (63.6%), smoked their first cigarette more than 60 min after waking (73.4%) and did not smoke in places where smoking is banned (86.0% indoors and 64.6% outdoors), suggesting low nicotine dependence.[17] Furthermore, 69.9% planned to quit and 32.4% had tried to quit in the last 12 months. Combined, these characteristics make this population of smokers more likely to successfully quit (if appropriately supported to do so),[25 26] which is good news from a public health perspective.

Besides the current tobacco control measures used in NZ, including higher cigarette taxes/prices, mass media campaigns, smokefree environments, publicly funded stop smoking medicines (nicotine replacement therapy), community-based stop smoking services, among others, it may be helpful to explore new approaches targeted at university/tertiary students, to reduce smoking in this population group. For instance, Quitline[27] could work closely with student associations, student unions/clubs or with university management teams to have information on its services included in orientation material, to reach a wider student population. Additionally, mobile phone-based interventions, including text messaging[28] and apps, which can easily be localised and owned by students, can be developed and tested. The vast majority of university students in NZ fall in the 16–34 years age group which is thought to be highly familiar with mobile technology and is most likely to own a smartphone.[29]

As far as we are aware, this is the first study to examine the prevalence and patterns of smoking in a national sample of university students aged 18–24 years in NZ. Repeat cross-sectional data are necessary to establish a clear picture of smoking in this population and to monitor any measures deployed to align smoking rates towards the Smokefree 2025 goal target.[3]

Strengths of this study include a reasonably large sample that was closely similar to NZ university students (table 2), making it likely that our conclusions may be generalisable to the wider university student population. The questionnaire was available online and in print to reach a wider student community and to increase the response rate; prevalence estimates for online and paper questionnaire responses were similar.

CONCLUSIONS

Our findings suggest that the prevalence of current smoking among university students in NZ aged 18–24 years is declining but daily smoking could be increasing, compared with previously reported estimates using 2013 data from five universities. Smoking among males and older students (aged 21–24 years) is of particular concern. However, many smokers appear to have a low nicotine dependence, and are willing to quit, suggesting smoking prevalence in this population could substantially be reduced and aligned with the Smokefree 2025 goal target of 5% or less by the year 2025.

We recommend greater presence and availability of smokefree services, and trialling of new technologies, such as mobile phone-based interventions, to support students who wish to quit. Follow-up studies on this segment of the population will help us to better understand the problem and update interventions to tackle it.

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