

# Do stress, life satisfaction, depression and alcohol use predict quitting among Aboriginal and Torres Strait Islander smokers?

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Smoking prevalence is higher among people with mental health problems.<sup>1</sup> Most of the lower life expectancy of Australians with mental illness is due to physical health conditions, especially smoking-related diseases such as cardiovascular diseases, cancer and chronic obstructive pulmonary disease.<sup>2</sup> Similarly, there is a strong association between smoking and excessive alcohol drinking and other substance use.<sup>1,3</sup>

Many health professionals and smokers believe that smoking relieves stress and helps people manage the symptoms of their mental illness, but this relief may be merely because smoking a cigarette relieves the recurring symptoms of nicotine withdrawal caused by the time elapsed since their previous cigarette.<sup>4</sup> A meta-analysis of 26 longitudinal studies published before May 2012 found that quitting smoking led to reduced depression, anxiety and stress and improved measures of mood and quality of life.<sup>4</sup> These estimated improvements were similar or greater than those seen in meta-analyses of medications for depression and anxiety. Longitudinal research enables the very different behavioural processes of starting and sustaining quit attempts to be examined separately.<sup>5</sup> Studies have found that more smokers with depression than without depression at baseline make a quit attempt by follow-up, even though fewer are able to successfully abstain from smoking.<sup>6,7</sup>

## Abstract

**Objective:** To examine whether baseline measures of stress, life satisfaction, depression and alcohol use predict making or sustaining quit attempts in a national cohort of Aboriginal and Torres Strait Islander smokers.

**Methods:** We analysed data from the nationally representative quota sample of 1,549 Aboriginal and Torres Strait Islander adults who reported smoking at least weekly in the Talking About The Smokes baseline survey (April 2012–October 2013) and the 759 who completed a follow-up survey a year later (August 2013–August 2014).

**Results:** More smokers who reported negative life satisfaction, feeling depressed, higher stress or drinking heavily less often than once a week at baseline made a quit attempt between the baseline and follow-up surveys. In contrast, of these smokers who had made quit attempts between surveys, more who reported higher stress were able to sustain abstinence for at least one month; other associations were inconclusive.

**Conclusions and implications for public health:** Health staff and Aboriginal and Torres Strait Islander smokers need not see being more stressed as an obstacle to quitting among Aboriginal and Torres Strait Islander people. Health staff should emphasise the benefits to mental health that come with successfully quitting smoking.

**Key words:** smoking, Aboriginal, Torres Strait Islander, Indigenous, stress

A literature review of 65 papers published before 2014 found misperceptions about the impact of cessation on the management of stress and mental health symptoms. It also found other perceived barriers to smoking cessation among people with mental illness: lack of cessation support from health professionals, high prevalence and social acceptability of smoking and perceptions of low motivation to quit.<sup>8</sup>

Longitudinal research found that less frequent episodes of heavy drinking was associated with both making a quit attempt

and being successfully abstinent at follow-up.<sup>9</sup> Other measures of drinking frequency and quantity were less consistently associated with quitting.<sup>9</sup> The associations did not vary between the four countries in the study (Australia, Canada, UK and US) and were not explained by differing motivation to quit, suggesting a possible role for intoxication leading to relapse.

Daily smoking prevalence among Aboriginal and Torres Strait Islander people is falling, but at 39% it is still 2.8 times the prevalence of non-Indigenous Australians and is responsible

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for 12% of the total and 23% of the gap in the burden of disease.<sup>10-12</sup> In 2014–15, 29% of Aboriginal and Torres Strait Islander people reported a mental health problem (including alcohol or drug dependence), and more of those with mental health problems were daily smokers (46%) than those with or without other long-term health conditions (33% or 39%).<sup>9</sup> Thirty per cent reported exceeding NHMRC guidelines for single occasion risky drinking (greater than four standard drinks) in the past year, down from 38% in 2008.<sup>11</sup> Relief of stress is frequently reported as a cause of Aboriginal and Torres Strait Islander smoking.<sup>8,13-21</sup>

The baseline surveys of our Talking About The Smokes Project surveyed a national sample of 2,522 Aboriginal and Torres Strait Islander smokers and non-smokers between April 2012 and October 2013. Analyses of these baseline surveys found that the following mental health measures were associated with wanting to quit: not being satisfied with their life; being bothered by being depressed in the past month; more often having so many worries that they could not deal with them; and drinking more than five (for males) or four (for females) alcoholic drinks within two hours more than once a week in the past year.<sup>22</sup> Most (74%) ex-smokers agreed that they now cope with stress as well as when they were smoking and 90% agreed that their life was better now that they no longer smoked.<sup>23</sup> Smokers who perceived they had been treated unfairly in the past year because they were Aboriginal or Torres Strait Islander were more likely to have ever tried to quit and have made a quit attempt in the past year.<sup>24</sup> However, this perceived racism at baseline did not predict either making or sustaining a quit attempt between baseline and follow-up a year later.<sup>25</sup>

This paper extends our previous cross-sectional analyses with more methodically rigorous longitudinal analyses. To better understand the association between mental health and smoking cessation, we examined whether baseline measures of stress, life satisfaction, depression and alcohol use predict making or sustaining quit attempts between baseline and follow-up.

## Methods

### Survey design and participants

This paper concentrates on the 1,549 participants who smoked at least weekly at

the time of the Talking About The Smokes project baseline survey and the 759 (48%) of these who completed a follow-up survey approximately one year later (median 12 months, IQR 11–15 months), between August 2013 and August 2014.

Aboriginal and Torres Strait Islander people and Aboriginal Community Controlled Health Organisations (ACCHOs) were involved in all stages of the project: design, data collection, analysis and research translation. This community participation facilitates translation into improved policy and practice and supports self-determination.<sup>26</sup> These research methods have been reported in detail elsewhere.<sup>26,27</sup> Briefly, the baseline sample was recruited from communities served by 34 ACCHOs and the Torres Shire Council. Project sites were selected based on the population distribution of Aboriginal and Torres Strait Islander peoples, by state/territory and remoteness. Most interviewers were members of the local Aboriginal and Torres Strait Islander community or were well known locally within the community. The sample used quotas for even recruitment of men and women, and those aged 18–34 and ≥35 years of age, within the quota established for each site (50 smokers or recent quitters and 25 other non-smokers for 30/35 sites, which was doubled for four large urban sites and in the Torres Strait). All survey questions are available on the International Tobacco Control (ITC) Project website.<sup>28</sup> The project was approved by three Aboriginal Human Research Ethics Committees (HRECs) and two HRECs with Aboriginal subcommittees.

Our baseline sample had similar characteristics to a larger national random multi-stage clustered household survey for age, gender, jurisdiction, remoteness, quit attempts and smoking intensity, but inconsistent differences for some socioeconomic measures (unemployment, education and area-level disadvantage).<sup>27</sup> There were few differences between the baseline socioeconomic characteristics of those daily and weekly smokers recontacted and lost to follow-up.<sup>25</sup> However, more of those recontacted than those lost to follow-up were from regional areas and the most disadvantaged areas and fewer were aged 18–24 years. Fewer of those recontacted had made a quit attempt in the past year but there was no difference in smoking intensity.

### Predictor measures: stress, life satisfaction, depression and alcohol use

At baseline, we asked: “Are you satisfied with your life?” and “In the last month, have you been bothered by feeling down or depressed?” We reversed the order of the dichotomous life satisfaction responses in tables so they were in a similar direction to other variables. We assessed perceived stress in the past six months with two questions: “How often have you felt in control of the important things in your life?” and “How often have you felt you had so many worries that you could not deal with them?” ([1] all of the time, [2] most of the time, [3] some of the time, [4] a little of the time, [5] none of the time). The scores of the second question were reversed, and the average of the two scores was used for a combined measure of perceived stress, based on these two slightly modified items from the four-item Perceived Stress Scale as in previous ITC research.<sup>29,30</sup> We also asked: “In the last six months, have you received any professional support to help with stress or personal problems?” and “In the last year, how often did you have more than five (for males) or four (females) alcoholic drinks within two hours?” (collapsed to: almost every day or more than once a week vs. about one a month, less often/a few times a year, or never).

### Main outcome measures: quit attempts and sustained abstinence for ≥ one month

At follow-up, we asked: “Have you tried to quit since we last talked with you?” For those who had made a quit attempt, we asked: “Are you still quit, or are you back smoking?” and “Of all the times that you tried to quit smoking since [date of baseline survey], what is the longest period you stayed completely off the smokes?” Among those who were currently quit, we asked: “How long ago did your current quit attempt start?” From these four questions, we created two outcome measures: a) made any quit attempt; and b) among those who did: sustained abstinence for one month or more. As in recent ITC Project papers, we chose these measures because of growing evidence of different factors predicting starting a quit attempt and preventing relapse (i.e. sustaining abstinence).<sup>6</sup> We chose the one-month cutpoint to get as close to sustained abstinence as possible.<sup>31,32</sup>

### Intermediate attitudinal measures: smoking-related worry and regret, quit self-efficacy

At baseline, we assessed two attitudes that are known to predict making a quit attempt in this population, which are worry and regret about smoking. We asked: "How worried are you that smoking will damage your health in the future?" (very worried vs. not at all, a little or moderately worried) and "If you had to do it over again, you would not have started smoking" (agree vs. disagree, neither agree nor disagree or don't know).<sup>33</sup> We also asked "How easy or hard would it be for you to quit smoking/ stay off the smokes?" (very hard vs. very easy, somewhat easy, neither easy or hard, a little bit hard or don't know); i.e. quit self-efficacy, which predicts sustaining abstinence  $\geq 1$  month.<sup>33</sup>

### Time and other covariates

We derived a variable to control for variation in the number of months between the baseline and follow-up surveys (with four categories of similar sample size: <11 months,  $\geq 11$  months and <12 months,  $\geq 12$  months and <14 months,  $\geq 14$  months). We used covariates known to predict making quit attempts (gender, smoking-induced deprivation [whether in the past six months, money spent on cigarettes left not enough money for food or other household essentials], having made a quit attempt in the past year, having noticed anti-tobacco advertising in the past six months and having been advised to quit by a health professional in the past year) and sustaining abstinence  $\geq 1$  month (smoking-induced deprivation, having previously sustained attempts  $\geq 1$  month and non-daily smoking).<sup>33</sup>

### Statistical analysis

All analyses were conducted with Stata 14. We used chi-squared tests to compare the baseline characteristics of our cohort to those lost to follow-up, except when we used t-tests to compare stress scores. We do not report the confidence intervals of these or other percentages, as it is not considered statistically appropriate to estimate sampling error in non-probabilistic quota samples.<sup>34</sup>

We used logistic regression to assess associations between each predictor measure and the two main outcome measures (just controlling for the time interval between surveys, adjusted for intermediate measures and adjusted for other co-variables known

to predict each outcome), and to assess the baseline cross-sectional association between each predictor measure and the three intermediate attitudinal outcome measures. Confidence intervals were adjusted for sampling design, using Stata's SVY commands to treat the 35 project sites as clusters, and *p*-values were based on adjusted Wald tests.

Analyses excluded refused and don't know responses, except for intermediate attitudinal outcome measures that included don't know responses in the combined negative and neutral category of the dichotomised variables. This excluded less than 3% of the data, except for the outcome sustain abstinence (6.4%, 24/376, among those who made a quit attempt) and the covariate advice from a health professional (4.1%, 30/739).

## Results

At baseline, most smokers were satisfied with their life (85%) or felt in control of the important things in life all or most of the time in the past six months (64%); about half were not bothered by being depressed in the past month (53%) or felt they had so many worries that they could not deal with them

only a little or none of the time in the past six months (50%), see Table 1. Only a minority of the smokers had received any professional support to help with stress or personal problems in the past six months (27%) or drank more than five (for males) or four (females) alcoholic drinks within two hours more than once a week in the past year (37%). We did not detect any significant difference in these results between the cohort and those lost to follow up.

### Quit attempts

More smokers who reported negative life satisfaction (OR 1.69), feeling depressed (1.59) or more stress (OR 1.30 for increasing average stress score by one) and fewer who reported drinking 5/4 drinks in two hours more than once a week (OR 0.72) at baseline made a quit attempt between the baseline and follow-up surveys (Figure 1). The magnitudes of these associations were only slightly reduced after controlling for other known predictors of making quit attempts (Supplementary Table 1).

### Sustaining abstinence

In contrast, of those smokers who had made quit attempts between surveys,

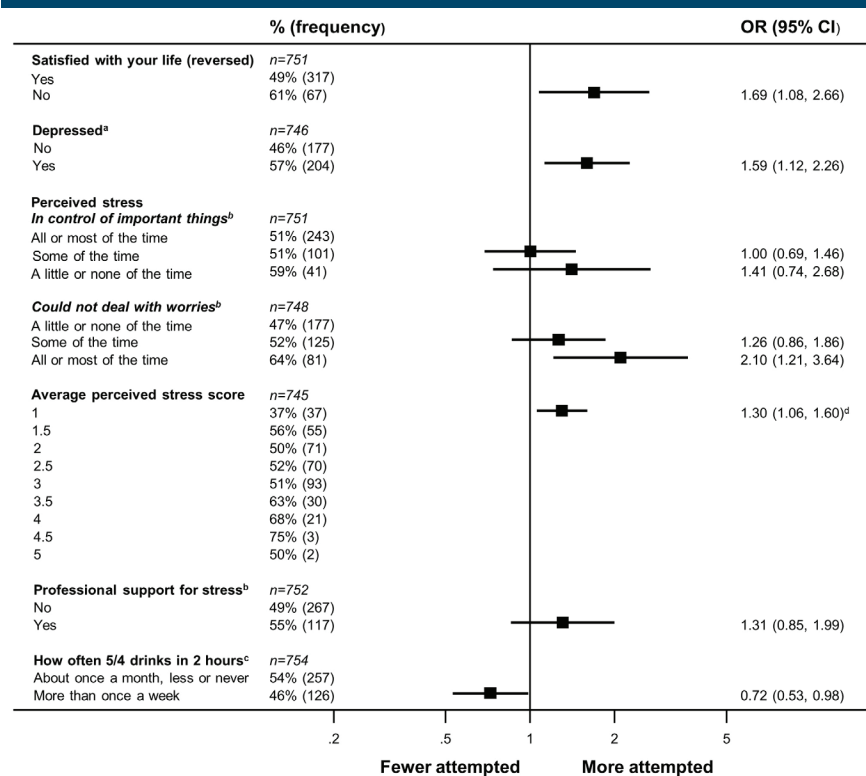
**Table 1: Baseline characteristics of daily or weekly smokers in the cohort and those lost to follow-up.**

	Cohort % (frequency) n=759	Lost to follow-up % (frequency) n=790	Total % (frequency) n=1,549	<i>p</i> -value <sup>a</sup>
<b>Satisfied with your life</b>	n=751	n=770	n=1,521	<i>p</i> =0.39
Yes	85% (641)	84% (645)	85% (1,286)	
No	15% (110)	16% (125)	15% (235)	
<b>Bothered by feeling depressed, past month</b>	n=746	n=761	n=1,507	<i>p</i> =0.41
No	52% (386)	54% (410)	53% (796)	
Yes	48% (360)	46% (351)	47% (711)	
<b>Perceived Stress</b>				
<b>In control of important things, past six months</b>	n=751	n=763	n=1,514	<i>p</i> =0.57
All or most of the time	64% (481)	62% (475)	63% (956)	
Some of the time	27% (200)	27% (205)	27% (405)	
A little or none of the time	9% (70)	11% (83)	10% (153)	
<b>Could not deal with worries, past six months</b>	n=748	n=761	n=1,509	<i>p</i> =0.59
A little or none of the time	51% (379)	48% (369)	50% (748)	
Some of the time	32% (242)	33% (249)	33% (491)	
All or most of the time	17% (127)	19% (143)	18% (270)	
<b>Average perceived stress score</b>	2.34 (2.28–2.41)	2.43 (2.37–2.48)	2.39 (2.34–2.43)	<i>p</i> =0.06 <sup>b</sup>
<b>Professional support for stress, past six months</b>	n=752	n=768	n=1,520	<i>p</i> =0.55
Yes	28% (211)	27% (205)	27% (416)	
No	72% (541)	73% (563)	73% (1,104)	
<b>How often 5/4 drinks in two hours, past year</b>	n=754	n=766	n=1,520	<i>p</i> =0.93
About once a month, less or never	64% (479)	63% (485)	63% (964)	
More than once a week	36% (275)	37% (281)	37% (556)	

Note:

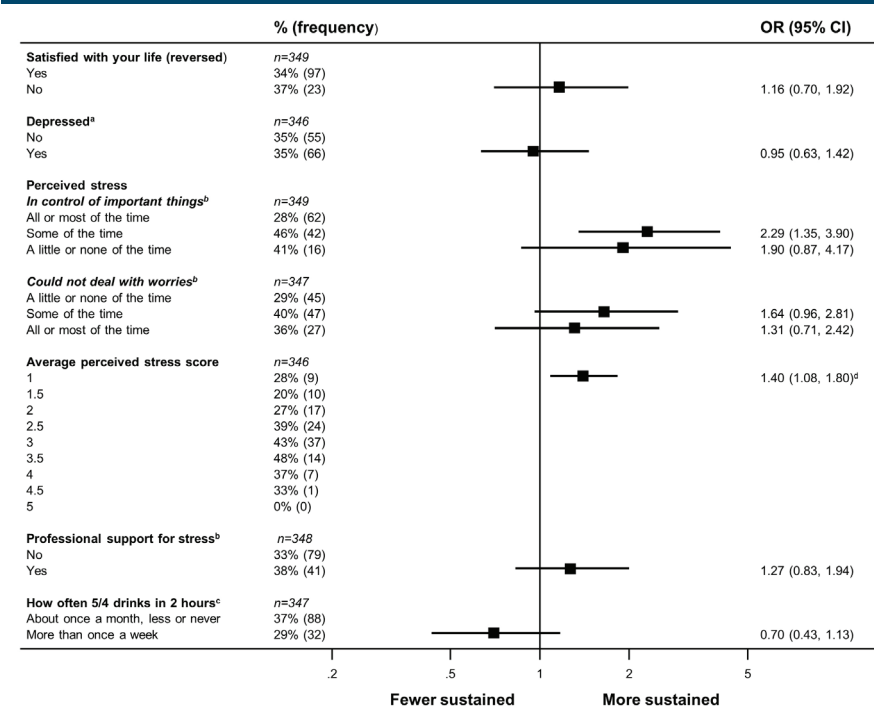
a: *p*-value calculated using chi-squared test, except when b: *p*-value calculated using t test.

**Figure 1: Association of baseline stress, life satisfaction, depression and alcohol use with making a quit attempt between baseline and follow-up survey in baseline daily/weekly smokers (n=759).**



Notes:  
 In the past a: month, b: six months or c: year.  
 d: Odds ratio of increasing score by one.

**Figure 2: Association of baseline stress, life satisfaction, depression and alcohol use with sustaining a quit attempt for a month or more between baseline and follow-up survey in baseline daily/weekly smokers who made a quit attempt between surveys (n=352).**



Notes:  
 In the past a: month, b: six months or c: year.  
 d: Odds ratio of increasing score by one.

more who reported higher stress than who reported lower stress (OR 1.40) were able to sustain abstinence for at least one month (Figure 2). Other associations with sustaining abstinence were inconclusive. The magnitudes of these associations were similar or increased after controlling for other known predictors of sustaining abstinence (Supplementary Table 2).

**Intermediate attitudes**

At baseline, more smokers were very worried that smoking would damage their health in the future if they reported negative life satisfaction (OR 2.62), feeling depressed (OR 2.25) or more stressed (OR 1.51), see Table 2. More smokers regretted starting smoking (agreed that if they had to do it over again, they would not have started smoking) if they reported more stress (OR 1.30), with other associations inconclusive, although there were borderline associations with negative life satisfaction and not drinking heavily more than once a week. Magnitudes of associations with making a quit attempt were reduced by controlling for these two intermediate measures, with negative life satisfaction, not dealing with worries and professional support from stress becoming no longer significantly associated with making a quit attempt (Supplementary Table 1).

More smokers said it would be very hard to quit if they reported negative life satisfaction (OR 2.01), feeling depressed (OR 1.82) or if they received any professional support to help with stress or personal problems (OR 1.35), although the association with stress was inconclusive (Table 2). In contrast to the intermediate factors for making a quit attempt, reporting that it would be very hard to quit had a more limited impact on the associations with sustaining a quit attempt (Supplementary Table 2).

**Discussion**

Stress may not be the major long-term obstacle to Aboriginal and Torres Strait Islander people quitting that others have previously reported.<sup>8,13,14,16-20</sup> We found that more smokers who reported being more stressed at baseline made and sustained quit attempts in the next year before follow-up, compared to those who were less stressed. Similarly, more smokers who were more stressed reported attitudes that predict making quit attempts but there were only inconclusive non-significant associations

between stress and quit self-efficacy that predicts staying quit.

This previous predominantly qualitative research has been based on smokers' retrospective perceptions of the barriers to quitting, which often include their perceptions of stressful events leading to an immediate relapse. Given the high frequency of stressful events in the lives of many Aboriginal and Torres Strait Islander people, smokers in this earlier qualitative research may have misattributed the cause of smoking relapses to adjacent stress while not noticing that attempts were also sustained during times of stress.<sup>35</sup> This misattribution could also be because relapse has been shown to increase perceived stress and sustained abstinence to reduce stress. It could also be because the ability to deal with stress and anger is worse in the first couple of months

after starting a quit attempt, before it later improves.<sup>30,36</sup>

In contrast to previous research reporting retrospective perceptions of the immediate impact of stress on quitting, we compared the prospective quitting outcomes over the next year of smokers who were more and less stressed at baseline. Similar longitudinal research in other settings has found mixed results, with most finding no significant results and some finding baseline higher perceived stress associated with fewer smokers successfully quitting, and none finding it associated with more smokers successfully quitting, as we did.<sup>37-44</sup> Unlike this previous longitudinal research that has concentrated on quit success, we assessed starting and sustaining quit attempts separately, acknowledging the different behavioural processes involved.<sup>5</sup> We have

more confidence in our unexpected results because they were not greatly changed after controlling for known predictors of starting and sustaining quit attempts. While our findings for smokers who had received professional support for stress were not statistically significant and so not conclusive, they too were in the same direction as our findings for stress.

The reasons for these unexpected results in this population are unclear, particularly for sustaining quit attempts. In this population, racism and financial pressures are possible causes of stress. While we previously found no association between perceived racism and quitting, we have found that smoking-induced deprivation (money spent on cigarettes leaving not enough money for food and other household essentials) was associated with more smokers starting

**Table 2: Association of baseline stress, life satisfaction, depression and alcohol use with baseline predictors of starting and sustaining a quit attempt (worried smoking will damage health in future, regret about starting smoking, quit self-efficacy) in baseline daily/weekly smokers (n=1,549).**

	Very worried smoking will damage health in future		Agree that if had time again, would not have started smoking		It would be very hard to quit	
	% (frequency)	OR (95% CI)	% (frequency)	OR (95% CI)	% (frequency)	OR (95% CI)
<b>Satisfied with your life (reversed)</b>	n=1,520	p<0.001	n=1,521	p=0.08	n=1,520	p<0.001
Yes	31% (403)	1	78% (997)	1	34% (434)	1
No	54% (128)	2.62 (1.69–4.05)	84% (197)	1.50 (0.96–2.36)	51% (119)	2.01 (1.41–2.87)
<b>Bothered by feeling depressed, past month</b>	n=1,506	p<0.001	n=1,507	p=0.29	n=1,506	p<0.001
No	26% (209)	1	77% (609)	1	30% (235)	1
Yes	45% (316)	2.25 (1.75–2.91)	80% (570)	1.24 (0.83–1.86)	43% (308)	1.82 (1.44–2.3)
<b>Perceived stress</b>						
<b>In control of important things, past six months</b>	n=1,513	p=0.002	n=1,514	p=0.02	n=1,513	p=0.78
All or most of the time	32% (303)	1	76% (725)	1	36% (340)	1
Some of the time	40% (163)	1.45 (1.10–1.91)	83% (336)	1.55 (1.14–2.11)	38% (154)	1.12 (0.81–1.53)
A little or none of the time	43% (66)	1.63 (1.15–2.32)	86% (131)	1.90 (0.98–3.69)	38% (58)	1.11 (0.73–1.69)
<b>Could not deal with worries, past six months</b>	n=1,508	p<0.001	n=1,509	p=0.44	n=1,508	p=0.48
A little or none of the time	27% (202)	1	77% (573)	1	34% (257)	1
Some of the time	39% (190)	1.71 (1.37–2.13)	79% (390)	1.18 (0.81–1.72)	37% (183)	1.14 (0.82–1.58)
All or most of the time	51% (137)	2.81 (2.11–3.74)	83% (223)	1.45 (0.82–2.56)	40% (108)	1.27 (0.85–1.90)
<b>Average perceived stress score</b>	n=1,503	p<0.001	n=1,504	p=0.03	n=1,503	p=0.22
1	21% (38)	1.51 (1.34–1.71) <sup>a</sup>	71% (126)	1.30 (1.03–1.63) <sup>a</sup>	33% (59)	1.13 (0.92–1.39) <sup>a</sup>
1.5	38% (62)		81% (133)		34% (56)	
2	27% (84)		73% (229)		37% (117)	
2.5	35% (106)		80% (243)		33% (101)	
3	39% (143)		83% (304)		38% (138)	
3.5	52% (53)		80% (82)		43% (44)	
4	57% (32)		93% (52)		41% (23)	
4.5	60% (6)		70% (7)		50% (5)	
5	50% (5)		80% (8)		50% (5)	
<b>Professional support for stress, past six months</b>	n=1,519	p<0.001	n=1,520	p=0.37	n=1,519	p=0.03
No	32% (349)	1	77% (855)	1	34% (379)	1
Yes	44% (182)	1.68 (1.30–2.17)	81% (338)	1.26 (0.75–2.12)	41% (172)	1.35 (1.04–1.75)
<b>How often 5/4 drinks in 2 hours, past year</b>	n=1,519	p=0.11	n=1,520	p=0.09	n=1,519	p=0.18
About once a month, less or never	37% (355)	1	81% (780)	1	37% (361)	1
More than once a week	32% (177)	0.80 (0.61–1.05)	75% (416)	0.70 (0.46–1.06)	34% (189)	0.86 (0.69–1.07)

Notes:  
 p-values calculated for whole variable using chi-square test.  
 a: Odds ratio of increasing score by one.

and sustaining quit attempts.<sup>25</sup> As with our results about stress, the latter finding is different from the extant literature. While more research is warranted, our anecdotal experience suggests a possible explanation worth exploration. Some Aboriginal and Torres Strait Islander smokers with many stressors and many factors potentially undermining their health and wellbeing choose to start to improve their health and lives by quitting smoking. This change in smoking behaviour may be seen as more achievable than other changes that are seen as too hard or beyond their control, such as dealing with structural racism or the ongoing impact of colonialism. Tackling multiple issues at once may seem too daunting. Successful quitting can lead to a sense of achievement and a broader empowerment to take on other issues, and vice versa.<sup>45</sup> This sense of achievement may be greater for those with more perceived stress at baseline, leading to more sustaining quit attempts in this group. It remains unclear why we found that greater perceived stress was associated with quit success in this population; this has not been found in other contexts, even though smoking is increasingly concentrated in disadvantaged populations with high exposure to (albeit somewhat different) stressors.

More smokers with higher stress, depression and negative life satisfaction made a quit attempt in the year following baseline, consistent with similar longitudinal research in other settings.<sup>6</sup> This may be in part because these factors lead to increased health worries, which in turn leads to increased motivation to quit, as controlling for health worries and regret reduced the magnitude of these associations.

Unlike stress, there was no significant association of depression and negative life satisfaction with sustaining quit attempts. More smokers with depression and negative life satisfaction at baseline reported that it would be hard to quit, suggesting that any increased motivation is undermined by reduced confidence that they will successfully quit. As has been suggested before, those with depression are more likely to expect negative and poorer outcomes.<sup>6</sup> We did not replicate the findings of previous longitudinal research that fewer smokers with depression sustained quit attempts or successfully quit, but our inconclusive results could be consistent with this research.

As with previous longitudinal research, we found that fewer smokers who more frequently drank alcohol heavily before baseline made a quit attempt in the next year, but we found only inconclusive evidence about the association between heavy drinking and relapse.<sup>9</sup> We cannot confirm or refute a role for heavy drinking in relapse in this population. Unlike previous research, we concentrated on this one measure of drinking and so cannot assess other ways drinking may be affecting quitting in this population. New research on the links between drinking and successfully quitting smoking may be needed in this population.

The main strengths of this study are that it is based on longitudinal rather than cross-sectional data, it deals with starting and sustaining quit attempts separately, and our cohort is broadly similar to the national Aboriginal and Torres Strait Islander population. While attrition led to no differences in the predictor measures, some caution is needed in generalising these results to more advantaged and more motivated Aboriginal and Torres Strait Islander smokers who were more likely to be lost to follow-up. Similarly, caution is needed in generalising these results to smokers with more severe depression and mental illnesses where smoking prevalence is higher and different processes may be involved.<sup>1</sup> We did not validate self-reported quitting with biomarkers. However, as this is not part of a treatment study and smoking is still quite acceptable in this population, we do not believe there will be much over-reporting of quitting. However, as many quit attempts are very short and so may not be remembered at follow-up,<sup>46</sup> there may be some misclassification bias to the null of our analyses of starting quit attempts but much less of the analyses of sustained attempts (although the latter analyses have less power due to their smaller sample size). Our study was too small to use a cutpoint later than one month to assess longer abstinence, even though longer abstinence is necessary for health gains and predictors of relapse change over time.<sup>47</sup>

Our predictor measures do not provide a complete picture of mental health and wellbeing. Our survey was long and focussed on smoking-related behaviours and attitudes, and like similar ITC surveys, we did not have space for a series of questions required for standard validated holistic measures of mental health and wellbeing. The recently

commenced *Mayi Kuwayu* longitudinal study of the Aboriginal and Torres Strait Islander population will not only have a much larger sample size to enable such examination of long-term quit success, but it is also assessing many more measures of mental health and wellbeing and stressors, so may be able to better understand the unexpected association between stress and quitting smoking in this population.<sup>48</sup>

## Conclusions

Health staff and Aboriginal and Torres Strait Islander smokers can be confident that being more stressed may not be the major long-term obstacle to quitting that has previously been reported. Health staff should emphasise the research that demonstrates the benefits to stress management, mental health and wellbeing that are provided by successfully quitting smoking. Being more stressed or depressed could be seen as a reason to initiate rather than postpone a quit attempt.

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## Supporting Information

Additional supporting information may be found in the online version of this article:

**Supplementary Table S1:** Association between baseline stress, life satisfaction, depression and alcohol use and making a quit attempt between baseline and follow-up survey in baseline daily/weekly smokers (n=759).

**Supplementary Table S2:** Association between baseline stress, life satisfaction, depression and alcohol use and sustaining a quit attempt for a month or more between baseline and follow-up survey in baseline daily/weekly smokers who made a quit attempt between surveys (n=352).