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Age as a Predictor of Quit Attempts and Quit Success in Smoking Cessation – Findings from the ITC 4-Country Survey (2002-2014)

Abstract

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Background and aims: Past research has found that young smokers are more likely to make quit attempts; however, there are conflicting findings regarding age and quit success. This study examined the degree to which smoker age is related to making quit attempts and quit success.
Design: 10 waves of the International Tobacco Control Policy Cohort Survey (ITC-4C) collected between 2002 and 2014, with 9 wave-to-wave transitions with predictors at the first wave predicting quit attempts and success by the next wave.
Setting: Canada, the United States, the United Kingdom, and Australia.
Participants: Data from 15,874 smokers categorized into four age groups at baseline (18-24, 25-39, 40-54, and 55+ years).
Measurements: Age, quit attempts and success (defined as ≥ 30 days abstinence, confirmed if possible on a third wave for recent attempts).
Findings: Older smokers were more likely to smoke daily (X^2 = 1557.86, r=0.136, p <.001) than younger smokers. Daily smokers were less likely to report quit attempts (38.1% vs 58.2%) and to achieve 30 days of abstinence (22.9% vs 34.3%) than non-daily smokers. Older daily smokers were less likely to make quit attempts (0.61; CIs 0.54- 0.70, p<.001) even after controlling for indicators of nicotine dependence, country, sex, education, income, relationship status and household composition, than younger smokers. Younger smokers (<25) were more likely to succeed for at least 30 days of abstinence, but only when compared

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with those aged 40-54 (0.83; CIs 0.70-0.99). However, when controlling for heaviness of smoking the age effect disappeared. Significant interactions with age were found between age and intention when predicting quit attempts, and age and heaviness of smoking when predicting quit success.

Conclusions: An international cohort study indicates that young smokers are more likely to attempt to quit and appear to have similar levels of success in abstaining from smoking compared with older smokers when controlling for dependence. Quit success in all ages is most predicted by lower levels of nicotine dependence.

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Introduction

Tobacco use represents a serious health risk and is responsible for the premature deaths of between a half and two-thirds of all long-term smokers[1, 2]. To assist in the reduction of smoking prevalence and the associated health consequences, it is important to understand the challenges that smokers face in attempting to quit and maintaining successful quit attempts.

Previous research indicates that there are different predictors for making a quit attempt compared to sustaining abstinence after making a quit attempt [3, 4]. For example, motivation to quit predicts making quit attempts, but is not a strong predictor of long-term smoking abstinence, or in some instances even predicts failure[5, 6]. Similarly, number of recent quit attempts predicts future quit attempts, but is negatively related to smoking abstinence [7, 8]. Other studies suggest a different set of factors that are predictive of cessation maintenance, but not quit attempts, such as self-efficacy[6, 9], higher socioeconomic status[10, 11], and length of past quit attempts[12, 13]. Level of nicotine dependence has been found to related to both quit attempts and quit success[3, 14, 15].

Age is another factor that has been shown to be related to making quit attempts and refraining from smoking. Generally speaking, the literature consistently shows that younger smokers make more quit attempts, while mixed age effects have been found for smoking abstinence. The effects of age on quit success are inconsistent in the literature. While some studies report no significant difference between age groups[4, 16-19], others report that older smokers are more likely to succeed in their attempts to quit[20-25]. In contrast, two studies report that younger smokers have a higher chance of quit success[3, 26].

In taking note of the dates of these publications, it appears that those which claim a significant increase in chances of quitting with older age date between 1992 and 1998. Those that report no significant difference date between 2001 and 2013, and those that report significant greater success among younger smokers over older smokers are currently few but are dated 2006 and 2008. This may suggest a change in smoking trends, where older smokers were once more successful quitters, but that trend is becoming increasingly weak, possibly to the point of reversal. A 2002 report by Gilpin and colleagues[27] collated data about cessation trends from the 1950s to early 1990s and noted an increasing rate of cessation among the under 35 year old group compared to the over 35 group from the early 80s that persisted towards the early 1990s. This trend placed the younger group higher in successful cessation rate than the older group by the end of the data collection period, in contrast to earlier collected data. It seems plausible that this trend has continued into recent years, and this could explain the inconsistencies on reporting of quit rates by age. It is possible that while younger smokers used to be least effective at quitting successfully, they have now become most effective.

Classical theories of addiction such as disease[28] and learning models[29] would suggest that the greater the frequency of use of a potentially addictive substance, the greater the strength of the addiction, although perhaps only up to some asymptote. As applied to smoking, this implies that older smokers are more addicted than younger ones, due to their longer history of cigarette consumption. Thus, older smokers should have greater trouble with quitting. Should this not be the case, it would suggest that there are other significant factors affecting quitting outcomes above and beyond historical volume and regularity of cigarette

consumption. Alternatively, it is possible that younger smokers may be less inclined to try to quit either because they have not experienced adverse effects and/or because the risk is too far in the future to concern them.

Given the inconsistency around the relationship between age and quitting behaviours, this paper aimed to examine the degree to which age predicted quit attempts and quit success. A secondary aim was to examine the success of younger smokers in quitting short-term over the period of data collection. It was hypothesised that younger smokers would be more effective at both initiating quit attempts and maintaining abstinence to reach criteria of quit success, and that younger smokers would experience greater increases of quitting success when compared to other age groups over time. This study was conducted over a 12-year period across four countries, which allowed us to examine whether the relations between age and quit attempts and abstinence were consistent across western cultures and allow for greater generalisability of the results.

Methods

Data Source

All data analysed in this paper comes from waves 1 to 10 of the ITC-4 Survey. The ITC-4 Survey is a prospective cohort study originally implemented in 2002 to evaluate anti-smoking policies across four countries: Australia, the United States, the United Kingdom, and Canada. The first wave, collected between October and December 2002, recruited the initial cohort of at least 2000 smokers per country. The last wave of included data was collected in 2014. Recruitment was conducted through probability sampling methods in each country, stratified for geographic region and community size, and replenished at each wave to ensure a minimum 2000 participants. Random digit dialling was used to recruit current smokers to participate in the 35-minute main survey and subsequent follow-ups. Participants were asked questions on many topics including policy, quit behaviours, brands and advertising. Follow-up completion rate averaged 75% across countries, and participants were retained if they stopped smoking in subsequent waves. For a detailed description of the study, refer to the published protocol[30].

Study Population

This study consists of a sample of a total 36,367 unique smokers of age 18 and above who were recruited from Australia, the United States, the United Kingdom, and Canada across 10 waves of data. Each wave consists of three types of survey: recruitment, replenishment, and the main survey. The recruitment survey is a short, 10-minute introduction call to source new participants, who are then administered the replenishment survey if they are participating in the ITC-4 Survey for the first time, to replace participants who have dropped out. Participants that have participated before are administered the main survey, which asks follow up questions based on responses in a previous wave, as well as many other smoking-related questions. The first wave consists of only a recruitment and main survey, however the main survey is shorter than following waves, and does not have follow-up data. Therefore, only data from waves two to ten and only from the main surveys are used as outcome variable data in this study, whereas predictor variables are obtained from waves one to nine. As such, individuals with data used here must necessarily have participated in at

least two waves to allow for follow-up data (n=15,874). Smokers were defined as individuals who had smoked (a) at least monthly, and (b) at least 100 cigarettes in their lifetime.

Measures

Outcome Measures

There were three main outcome measures, each measured at each wave after the first: 1) Quit Attempts (yes, no): Defined as responding positively to the question "Have you made any attempts to stop smoking since we last talked with you?"; 2) Quit Success (yes, no): Defined as being smoke-free for at least 30 days at any point during the inter-wave interval, regardless of whether that attempt continued or relapsed. Attempts begun just before a survey was administered that do not reach 30 days are excluded from the analysis of that wave and carried over to the next wave. Success was determined through changes to smoking status between waves, and additionally by self-identified quit attempts that were reported to last at least 30 days. Two models are constructed based on this variable. The first is restricted to participants who have made a quit attempt in the inter-wave interval, the second is among all participants; and 3) Quit Success (yes, no): Defined as being smoke-free for at least 6 months during the inter-wave interval. Calculated as above.

Predictor Variables

There were 4 predictor variables measured at the first wave and considered fixed throughout: 1) Country (Australia, UK, USA, Canada); 2) Age at recruitment (18-24, 25-39, 40-54, 55-max); 3) Sex (male, female); and 4) Household composition (single adult smoker, all adult smokers, mixed adult household).

There were 5 predictor variables collected at each wave: 1) Income categories (low, moderate, high): This variable is standardised across countries with different currencies for annual household income. Low income is defined as less than $30,000 (or £30,000); moderate income was defined as between $30,000 and $59,999 (or £30,000 and £44,999); high income was defined as greater than $60,000 (or £45,000); 2) Education (low, moderate, high): This variable is standardised across the countries with different education systems. Low levels were defined as having completed secondary/high school or less; moderate levels were defined as having attended college, trade or technical school or some university without having finished a degree; high levels were defined as having completed a university degree; 3) Marital status (in a committed relationship or not); 4) Intention to quit (within the next month, within the next six months, beyond the next six months, not planning to quit); 5) Heaviness of Smoking Index (0 to 6): This variable is a combination of two sub-variables: number of cigarettes per day (0 = 1-10, 1 = 11-20, 2 = 21-30, 3 = 30+), and time to first cigarette (0 = >60 min, 1 = 31-60 min, 2 = 6-30 min, 3 = <5 min) to create a total scale of 0 to 6 overall.

Statistical Analysis

To identify and control for any relationships between age and smoking regularity, an initial chi-square test was conducted to establish significant differences between daily and non-daily smokers. This was followed by preliminary checks of the independent variables to be included in a regression model to satisfy underlying statistical assumptions. A generalised estimating equations (GEE) model with a binary outcome and logistic link was used in order to account for within-subject autocorrelation across study waves. A first order autocorrelation pattern (AR(1)) was used to model within-subjects covariance pattern and a robust sandwich

estimator was used to estimate model standard error. All covariates were categorical, and model-based odds ratios (ORs) and their 95% confidence intervals (95% CI) were estimated to examine the relationship between the outcome and covariates. Due to identified significant associations between age and some known determinants of quit activity (i.e. smoking heaviness and quitting intentions), each model is presented in three stages of reducing constraints, with a single associated variable added in each stage, to identify to what extent any age-related effects were independent of these, or potentially due to them, at least in part. For GEE models, data was considered to be missing at random. Alpha was set at 0.05. Missing data for time invariant predictors were 2.7% for household composition and 0 for all others. Missing data for time variant predictors were 5.8% for HSI, 7.1% for intention to quit, 11.4% for income, 0.6% for education and 9.8% for marital status. Given the high numbers of missing cases for income and marital status, where these were not significant, the analyses were rerun without them to check if their omission had any effect. No notable effects were detected. As the trial was not pre-registered, the findings should be treated as exploratory.

Results

The characteristics of the ITC-4 sample are presented in Table 1.

(TABLE 1 HERE)

Note: An 'episode' is an instance of someone making a quit attempt. A single participant can have multiple episodes over the duration of their participation in the study.

Initially, we compared the association between daily and non-daily smoking status smokers with making quit attempts and smoking abstinence using chi-square statistics. As shown in table 2, non-daily smokers were significantly more likely to make a quit attempt compared to daily smokers (58.2% vs 38.1%). Non-daily smokers were also significantly more likely to succeed in abstaining from smoking for at least one month compared to daily smokers in both a population limited to those who had made quit attempts (34.3% vs 22.9%) and a population of all participants (19.6% vs 8.5%). This effect was confirmed with a six month abstain criterion with non-daily smokers quitting successfully more often (19.4% vs 13.1%; X^2 = 36.551, p <.001). Daily smokers have significantly worse cessation outcomes than non-daily smokers. Since daily smokers represent the large share of smokers in the population and the group at highest risk of developing smoking-related illnesses, all remaining analyses are restricted to daily smokers.

(TABLE 2 HERE)

Chi-square analyses between age and smoking-related factors revealed interdependence between factors. Older smokers were more likely to be heavier smokers. (X^2 = 1557.86, r=0.136, p <.001), intention to quit was lower at older ages (X^2 = 2161.12, r = –0.135, p <.001), and intention to quit was lower at higher levels of smoking heaviness (X^2 = 1269.13, r = –0.133, p <.001). As a result, these factors were entered sequentially into multiple regression models and interpreted at each step.

In GEE models we did not observe any age by survey wave interactions for quit attempts or smoking abstinence, showing that age-related effects did not change over time. In subsequent models we adjusted for survey wave.

Table 3 shows the predictors of reporting a quit attempt during the inter-wave intervals for 13,450 smokers over 30,417 episodes. Overall, 39% of the sample made a quit attempt. Older smokers were less likely to make a quit attempt (e.g. 55+ vs 18-24 year olds, OR = 0.61 (0.54, 0.70)). UK smokers were less likely to make a quit attempt than those from Canada (OR = 0.82 (0.75, 0.89)). Smokers with high education were more likely to make a quit attempt (OR = 1.21 (1.11, 1.32)). Males were less likely to make a quit attempt (OR = 0.90(0.85, 0.96)).

In a model with HSI and intention to quit, there was no change in the above results. Smokers with no immediate intention to quit were much less likely to attempt quitting than those who intended within a month (OR = 0.12 (0.10, 0.13). Smokers with the highest level of HSI were less likely to attempt quitting compared to the lowest level (OR = 0.60 (0.50, 0.72). A significant age by intention interaction was identified (X^2 = 24.413, p = .004). No significant interaction was found between age and HSI in this model (X^2 = 1.04, p = .653).

(TABLE 3 HERE)

The age by intention interaction was further investigated by re-running models with age transformed to a binary variable split at 40 based on sensitivity analysis conducted by Le Grande et al[31]. A GEE binary logistic model predicting quit attempts with age split at 40 and all other covariates as listed above also found a significant interaction between age and intention to quit ($X^2 = 11.529$, $p = .009$). Once completing this split, we noted that the effect size for age and intention in the new models was less than in the non-split model. We then compared different splits to find one that more closely resembled the effect size of the original interaction term. The greatest effect size was identified when grouping the 18-24 category separately to 25+ ($X^2 = 14.089$, $p = .003$) and so a split was introduced at this point to compare the groups on intention. Table 4 presents the association between key predictors of quit attempts by age.

(TABLE 4 HERE)

Table 4 shows significant differences in predictors of quit attempts across age categories. HSI (18-24: $X^2 = 23.80$, $p < .001$; 25+: $X^2 = 67.90$, $p < .001$) and intention to quit (18-24: $X^2 = 115.15$, $p < .001$; 25+: $X^2 = 2229.59$, $p < .001$) are both significant for each age group, though both variables appear less predictive for the younger age group. Country is significant for the older category overall and shows older Australians are more likely to make a quit attempt than older Canadians (OR = 1.10 (1.02, 1.20)). A slight sex effect exists in the older category with older males attempting to quit slightly less than females. Income is significant for the older age group with moderate and high income smokers attempting to quit less than low income smokers. Education is non-significant for both groups. Since there appeared to be significant differences between intention categories between the age groups, we further investigated this effect by running independent regression models limited to each group of quitting intention. Predictive effects were largely similar for all groups that reported intending to quit and so the categories were simplified into a binary response to quit intention. Table 5 reports the age effects these models. Intention to quit is a significant predictor of quit attempts for both smokers that reported no intention to quit ($X^2 = 40.17$, $p < .001$) and those that reported they intended to quit ($X^2 = 45.27$, $p < .001$). For smokers that reported no intention to quit, younger smokers were more likely to make a quit attempt than each other age category at roughly consistent levels (25-39: OR = 0.53; 40-54: OR = 0.45; 55+: OR = 0.57). For the intending to quit group, the differences compared to the youngest group were smaller for the middle age groups (25-39: OR = 0.83; 40-54: OR = 0.81), however there was no difference between the youngest and oldest age category (OR = 1.04 (0.92, 1.19)).

(TABLE 5 HERE)

Table 6 shows the predictors of maintaining a quit attempt for at least 30 days, given that an individual has made a quit attempt. Of the 7255 cases where individuals reported having made a quit attempt 22.9% reported maintaining it for at least 30 days. Individuals

from both the UK and Australia were significantly more likely to quit successfully than Canada (OR = 1.54 (1.34, 1.75); (OR = 1.21 (1.06, 1.37) respectively). High income individuals were significantly more likely to quit successfully (OR = 1.37 (1.20, 1.57)), unpartnered individuals were less likely to quit successfully (OR = 0.80(0.71, 0.9)) and greater heaviness of smoking predicted less success (OR = 0.44 (0.32, 0.63)). No age group was significantly associated with greater or lesser success. No significant interaction was found between age and intention in this model, however inclusion of an age and HSI interaction term caused the Hessian matrix to become singular and the model could not be run. Due to recent work on more recent ITC data by Le Grande et al [31], it was expected that an interaction would be found here so a simpler binary logistic regression model was run including the interaction term. However, this model showed weak, non-significant evidence of an interaction between these variables ($X^2 = 4.005$, $p = .045$).

(TABLE 6 HERE)

An additional analysis of quit success predictors at one month was run for all participants, that was not limited to those who had made a quit attempt (Table A). This analysis demonstrated a significant age effect with all age categories older than the 18-24 group experiencing less quit success when compared to the younger group, especially the 40-54 group (OR = 0.58(0.48, 0.69)) in a model absent of HSI and intention to quit. With those variables included, only the 40-54 group is significantly lower than 18-24 (OR = 0.75(0.62, 0.89)). All other effects are consistent with the model limited to those who had made quit attempts, except that high education was significantly more predictive of quit success (OR = 1.25(1.10, 1.41)).

To further investigate and support the above described effects, the quit success results were replicated with a six month cessation criterion for success (6641 cases, 9940 episodes). All predictors of quit success were consistent with the one month model except that intention to quit lost significance as a predictor ($X^2 = 7.149$, $p = 0.067$). See supplementary table (Table B).

Discussion

The main findings this study are: (1) daily smokers are less likely to try to quit and less likely to succeed than non-daily smokers. Among daily smokers; (2) age, heaviness of smoking and intention to quit are interrelated factors that predict quit attempts and smoking abstinence; (3) younger smokers are significantly more likely than older smokers to make a quit attempt; (4) after adjustment for indicators of nicotine dependence smoking abstinence is unrelated to age; (5) the relationship between age, intention to quit and quit attempts is stronger in the older age groups; (6) heaviness of smoking and intention to quit explain much of the relationship between age and quit success; and (7) predictors of 1 month quit success are largely similar to predictors of longer-term (6 months) quitting success; and (8) we did not find evidence that predictors of quitting are changing over time.

The results also show that non-daily smokers are more likely than daily smokers to make quit attempts as well as more likely to succeed up to both the one-month and six-month criteria. Non-daily smokers are 20% more likely to make a quit attempt than daily smoker in a given period and just over 10% more likely to succeed at one month. Given that these two groups have such different cessation outcomes, it makes sense to approach them differently when assessing what leads to quitting or failure, and perhaps also when implementing interventions.

Despite existing literature suggesting that cessation behaviours might have been changing differently between age categories in the past few decades, we found no evidence of any trend over the period 2002-2014. Age effects also remained consistent over the period of data collection. If there were any trends before that, they have stabilised by 2002.

For daily smokers, an important predictor across quit attempts and quit success was nicotine dependence. With every one point increase in the heaviness of smoking index, likeliness of both attempts and success were reduced. Odds of making a quit attempt were reduced by around 40% for a HSI rating of six compared to a rating of one. Similarly, with successful cessation, odds were reduced by about 60% for someone on the highest end of the scale. This is consistent with past research demonstrating the importance of nicotine dependence in cessation[3, 14, 15, 20, 25, 32, 33].

This study hypothesised that younger smokers would be more effective quitters. While the increased rate of attempts among younger smokers was confirmed, even when controlling for smoking characteristics, this relationship did not carry through to success, which would seem to indicate that younger smokers have equivalent difficulty to older smokers with maintaining quit attempts when their generally lower levels of dependence (as measured by the HSI) are controlled for. Intention to quit was an important predictor of quit attempts, with participants reporting that they did intend to quit being just over eight times more likely to attempt to quit compared to participants that reported they did not intend to quit. This aligns with previous research[6] and is consistent with the proposition that making quit attempts is under some degree of volitional control.

Any relationship between age and quit success appears to be less direct than between age and quit attempts. For success, age is significant when HSI and intention to quit are not controlled for. This effect remains consistent when introducing intention to quit into the model, however when introducing HSI the age relationship became non-significant. Taken together, these results imply that any potential relationship between age and success is largely

explained by age-related differences in HSI, indicating lower dependence. Intention to quit has a perverse relationship with quit success in that it is only a significant predictor of quit success for those reporting no intention to quit, who were roughly 40% more likely to quit successfully (given they have tried) for one month than those who had intended to quit in the next month. While this seems counterintuitive, it is possible that this effect represents a small group previously uninterested who change, while strong interest in quitting among those still smoking may reflect high difficulty [34, 35] especially as the average smoker makes many unsuccessful quit attempts [36]

The results indicate that as smoker ages, their intention to quit reduces, and their smoking heaviness increases. This correlation with HSI is consistent with previous research that has identified 'hardening' in smoking populations with motivation decreasing and dependence increasing as they get older[37].

The interaction between key variables and age provides justification for treating certain age brackets as distinct groups when addressing smoking cessation. Significant differences were identified between the 18-24 and 25+ age groups in terms of predictors of making quit attempts. The 25+ age group varied significantly in quit attempts across countries, whereas the younger group was consistent across countries. For smoking specific predictors, in both groups HSI and intention significantly predicted making a quit attempt, however the effect sizes for the older group were roughly three times the younger group for HSI and 20 times the younger group for intention. This likely represents a much higher importance of those factors in making quit attempts for people aged 25 and above.

Use of a six-month criterion for quit success showed largely the same predictors for success as the one-month criterion. The only significant difference between the models was that the intention effect was attenuated and no longer significant, possibly suggesting less effect on longer term abstinence, however as the sample was necessarily smaller, some caution is required in assuming this interpretation. That said, this conclusion should be restricted to potential influences measured before quitting, as there is evidence that measures assessed post quitting do vary in predictive power as a function of time quit [38].

The strengths of this study rely on the large sample size as well as the nationally representative samples of daily smokers. That we found no evidence of interactions by country suggests the findings are likely to be universal, at least to countries with similar strong tobacco control policies and public understanding of the harms of smoking.

However, the study is limited by the self-report nature of the survey, long follow-up times, and relatively low numbers in the younger age categories. We know there is a lot of forgetting of short attempts in particular[36] but as more dependent smokers are more likely to have short attempts, this is more likely to have attenuated the observed associations. Also, because the quit attempts vary in time from the collection of the baseline predictors, the likelihood of changes in these prior to the actual quit attempts is likely to have attenuated the relationships observed (i.e. by adding error). In this regard, the quit attempt studied was the last reported and, in some cases, there will have been intervening failed attempts between the measures taken and the outcomes, which may further dilute any relationships.

Taken together, the results of this study help explain some of the inconsistencies of previous literature. It is clear that it is useful to separate the roles of age in quit attempts as compared with the success of attempts once initiated. Many of the contradictory earlier

findings were likely due to conflating the two and/or as a function of the proportion of cases where attempts were made. For example, clinical studies typically have high proportions making attempts, as they recruit those wanting to quit, while population-based studies like this one have much lower rates of attempts, so when the two are conflated factors influencing making attempts will play a more important role. There are multiple explanations for why younger smokers are more likely to make quit attempts. Traditional models of addiction that consider addiction as a progressive disease[28] claim that addiction, left untreated, worsens over time. Younger smokers have been experiencing addiction for a shorter period of time, and therefore should experience less biological and psychological addictive symptoms, making it easier to make quit attempts. This aligns with the correlation between age and smoking heaviness, as addiction is expected to worsen with age. This is also consistent with quit success not being linked to success once dependence is controlled for but does not explain the continuing independent prediction for attempts. Smoking may be less integrated into the lifestyle of younger smokers, so they may be more prepared to quit, perhaps in part as their social circumstances change (which they tend to do more frequently than for older people). Where they have become dependent, they may not yet have adjusted their lifestyle to better support their dependence, and thus be more prone to try to escape the clutches of dependence. This points to the importance of cessation interventions in the younger years, where smoking has had less time to become established, and cessation should be easier, reducing the risk of not being able to quit when in the age range where most of the harms occur.

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In-Text Figures

Table 1: Descriptive Statistics of Cases & Episodes

Variable	Categories	Cases		Episodes	
		Count	%	Count	%
Country	Canada	7,767	21.4	10,077	24.0
	USA	14,195	39.0	8,665	21.5
	UK	7,518	20.7	10,611	26.3
	Australia	6,887	18.9	11,035	27.2
Sex	Female	18,223	50.1	22,822	56.5
	Male	16,583	45.6	17,566	44.5
	Missing	1,561	4.3	-	-
Age at Recruitment	18-24	4,896	13.5	2,708	6.7
	25-39	10,084	27.7	10,301	25.5
	40-54	11,280	31.0	16,593	41.1
	55+	8,290	22.8	10,785	26.7
	Missing	1,817	5.0	1	0.0
Total		**36,367**		**40,388**	

Table 2: Summary Statistics for Quit Outcomes between Daily and Non-Daily Smokers

Variable	X^2, OR(95% CI)	Outcome	Daily Smokers (n, % of daily smokers)	Non-Daily Smokers (n, % of non-daily smokers)
Quit Attempts	422.78**, 2.27(2.09,2.45)	Attempt	14,371 (38.1%)	1,552 (58.2%)
		No Attempt	23,352 (61.9%)	1,113 (41.8%)
Quit Success – 1 month (Among triers)	94.90**, 1.76(1.57, 1.97)	Success	3,177 (22.9%)	508 (34.3%)
		Failure	10,702 (77.1%)	975 (65.7%)
Quit Success – 1 month (All cases)	351.95**, 2.61(2.35, 2.89)	Success	3,177 (8.5%)	508 (19.6%)
		Failure	34,083 (91.5%)	2,090 (80.4%)

*Note: * denotes p<.05, ** denotes p<.001*

Table 3: Predictors of Quit Attempts Among Daily Smokers

	n	% attempted	OR(95% CI)	χ^2 (d.f.)
Age at recruitment (years)				107.85 (3)**
18-24	1816	49.6	Ref	
25-39	7630	41.4	0.70(0.62, 0.80)**	
40-54	12840	36.9	0.56(0.50, 0.63)**	
55 and above	8131	39.4	0.61(0.54, 0.70)**	
Country				34.50 (3)**
Canada	7592	40.8	Ref	
USA	6796	39.8	0.97(0.89, 1.05)	
UK	7833	35.4	0.82(0.75, 0.89)**	
Australia	8196	41.7	1.02(0.94, 1.11)	
Sex				12.01 (1)*
Female	17012	40.4	Ref	
Male	13405	38.2	0.90(0.85, 0.96)**	

Income Categories				1.62 (2)
Low	9782	39.9	Ref	
Moderate	11036	38.5	1.00(0.93, 1.07)	
High	9599	39.6	1.04(0.96, 1.13)	
Highest Level of Education				12.90 (2)**
Low	15778	37.6	Ref	
Moderate	9766	40.8	1.11(1.04, 1.18)*	
High	4873	42.7	1.21(1.11, 1.32)**	
Household Composition				4.15 (2)
Single Adult Smoker	8587	40.2	Ref	
All Adult Smokers	7621	38.6	0.91(0.83, 1.00)	
Mixed Adult Household	14209	39.4	0.93(0.85, 1.01)	
Relationship Status				0.32 (1)
Partnered	16321	38.5	Ref	
Unpartnered	14096	39.3	0.98(0.91, 1.05)	
Model Two				
Age at recruitment (years)				70.19 (3)**
18-24			Ref	
25-39			0.75(0.66, 0.84)**	
40-54			0.62(0.55, 0.70)**	
55 and above			0.68(0.60, 0.77)**	
Heaviness of Smoking Index				154.18 (6)**
0	2558	50.7	Ref	
1	3242	47.0	0.95(0.85, 1.05)	
2	5636	41.1	0.78(0.71, 0.87)**	
3	9375	36.2	0.67(0.61, 0.74)**	
4	5806	34.3	0.63(0.57, 0.70)**	
5	2757	34.1	0.62(0.55, 0.70)**	
6	1043	29.1	0.51(0.43, 0.60)**	
Model Three				
Age at recruitment (years)				57.84 (3)**
18-24			Ref	
25-39			0.74(0.65, 0.83)**	
40-54			0.68(0.60, 0.77)**	
55 and above			0.83(0.74, 0.95)*	
Heaviness of Smoking Index				82.99 (6)**
0			Ref	
1			0.91(0.81, 1.02)	
2			0.78(0.70, 0.87)**	
3			0.70(0.64, 0.78)**	
4			0.69(0.62, 0.77)**	
5			0.70(0.62, 0.79)**	
6			0.60(0.50, 0.72)**	
Intention to Quit				2360.50 (3)**
In Next Month	2950	71.9	Ref	
In Next 6 Months	7045	57.0	0.55(0.50, 0.60)**	

Beyond Next 6 Months	11441	35.7	0.25(0.23, 0.28)**
Not Planning to Quit	8981	19.3	0.12(0.10, 0.13)**

*Note: * denotes p<.05, ** denotes p<.001*

Table 4: Predictors of Quit Attempts Among Daily Smokers Broken Down by Age

	18-24		25+	
	OR (95% CI)	**χ^2 (d.f.)**	**OR (95% CI)**	**χ^2 (d.f.)**
Country		2.132(3)		13.802(3)*
Canada	-		-	
USA	1.24 (0.92, 1.68)		1.08 (0.99, 1.17)	
UK	1.10 (0.80, 1.51)		0.96 (0.89, 1.05)	
Australia	1.06 (0.81, 1.38)		1.10 (1.02, 1.20)*	
Sex		0.464(1)		6.125(1)*
Female	-		-	
Male	0.93 (0.75, 1.15)		0.93 (0.87, 0.98)*	
Income Categories		3.909(2)		7.603(2)*
Low	-		-	
Moderate	1.05 (0.82, 1.35)		0.92 (0.8, 0.9)*	
High	1.28 (0.99, 1.65)		0.8 (0.8, 0.9)*	
Highest Level of Education		1.111(2)		3.287(2)
Low	-		-	
Moderate	1.02 (0.81, 1.82)		1.0 (0.9, 1.1)	
High	1.23 (0.83, 1.82)		1.0 (0.9, 1.1)	
HSI		23.798(6)**		67.904(6)**
0	-		-	
1	1.03 (0.73, 1.44)		0.92 (0.81, 1.03)	
2	0.67 (0.49, 0.91)		0.81 (0.73, 0.91)**	
3	0.60 (0.44, 0.83)*		0.73 (0.65, 0.81)**	
4	0.57 (0.40, 0.83)*		0.71 (0.63, 0.80)**	
5	0.66 (0.37, 1.17)		0.71 (0.62, 0.81)**	
6	0.22 (0.07, 0.73)		0.62 (0.52, 0.75)**	
Intention to Quit		115.149(3)**		2229.585(3)**
In Next Month	-		-	
In Next 6 Months	0.51 (0.36, 0.72)**		0.55 (0.50, 0.61)**	
Beyond Next 6 Months	0.24 (0.18, 0.34)**		0.26 (0.23, 0.28)**	
Not Planning to Quit	0.18 (0.12, 0.26)**		0.12 (0.11, 0.13)**	

*Note: * indicates p<0.05, ** indicates p<0.001*

Table 5: Age Predictors of Quit Attempts Broken Down by Intention

	Not Intending to Quit		Intending to Quit	
	OR (95% CI)	**χ^2 (d.f.)**	**OR (95% CI)**	**χ^2 (d.f.)**
Age		40.17(3)**		45.27(3)**
18-24	-		-	
25-39	0.53(0.41, 0.70)**		0.83(0.73, 0.94)**	

40-54	0.45 (0.35, 0.59)**	0.81(0.72, 0.91)**
55+	0.57 (0.44, 0.74)**	1.04(0.92, 1.19)

*Note: * indicates p<0.05, ** indicates p<0.001*

Table 6: Predictors of Quit Success (One-Month Criteria) Among Participants that had made a Quit Attempt

	n	% Success	OR	χ^2 (d.f.)
Age at recruitment (years)				11.07(3)*
18-24	833	24.5	Ref	
25-39	2951	25.8	0.96(0.79, 1.18)	
40-54	4457	22.3	0.83(0.68, 0.99)*	
55 and above	2961	24.4	0.99(0.81, 1.22)	
Country				57.37 (3)**
Canada	2877	21.5	Ref	
USA	2553	20.7	0.95(0.83, 1.10)	
UK	2596	28.8	1.54(1.34, 1.75)**	
Australia	3176	24.8	1.21(1.06, 1.37)*	
Sex				4.64 (1)*
Female	6461	22.8	Ref	
Male	4741	25.6	1.10(1.01, 1.22)*	
Income Categories				23.12 (2)**
Low	3615	19.9	Ref	
Moderate	3983	24.2	1.27(1.13, 1.44)**	
High	3604	27.6	1.37(1.20, 1.57)**	
Highest Level of Education				2.85 (2)
Low	5554	23.1	Ref	
Moderate	3724	23.8	1.04(0.94, 1.28)	
High	1924	27.0	1.12(0.98, 1.28)	
Household Composition				5.85 (2)
Single Adult Smoker	3242	21.6	Ref	
All Adult Smokers	2787	23.0	0.88(0.76, 1.03)	
Mixed Adult Household	5173	25.9	1.01(0.88, 1.17)	
Relationship Status				13.32 (1)**
Partnered	5915	26.3	Ref	
Unpartnered	5287	21.2	0.80(0.71, 0.90)**	
Model Two				
Age at recruitment (years)				8.7 (3)
18-24			Ref	
25-39			1.05(0.86, 1.27)	
40-54			0.96(0.79, 1.16)	
55 and above			1.14(0.93, 1.40)	
Heaviness of Smoking Index				113.75 (6)**
0	1162	35.1	Ref	
1	1436	28.0	0.94(0.79, 1.12)	
2	2214	25.0	0.76(0.65, 0.90)*	

3	3248	20.7	0.59(0.50, 0.69)**	
4	1944	18.3	0.52(0.44, 0.62)**	
5	905	16.2	0.49(0.39, 0.61)**	
6	293	16.1	0.44(0.32, 0.63)**	
Model Three				
Age at recruitment (years)				7.18(3)
18-24			Ref	
25-39			1.06(0.87, 1.29)	
40-54			0.95(0.78, 1.16)	
55 and above			1.12(0.91, 1.37)	
Heaviness of Smoking Index				121.06 (6)**
0			Ref	
1			0.94(0.79, 1.12)	
2			0.76(0.65, 0.90)*	
3			0.58(0.50, 0.68)**	
4			0.51(0.43, 0.61)**	
5			0.46(0.38, 0.59)**	
6			0.43(0.30, 0.60)**	
Intention to Quit				24.33 (3)**
In Next Month	2022	23.3	Ref	
In Next 6 Months	3775	23.4	1.02(0.89, 1.16)	
Beyond Next 6 Months	3818	23.1	1.08(0.94, 1.23)	
Not Planning to Quit	1587	28.2	1.41(1.20, 1.65)**	

*Note: * denotes p<.05, ** denotes p<.001*