

Individual-level factors associated with intentions to quit smoking among adult smokers in six cities of China: findings from the ITC China Survey

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ABSTRACT

Background Over 350 million smokers live in China, and this represents nearly one-third of the smoking population of the world. Smoking cessation is critically needed to help reduce the harms and burden caused by smoking-related diseases. It is therefore important to identify the determinants of quitting and of quit intentions among smokers in China. Such knowledge would have potential to guide future tobacco control policies and programs that could increase quit rates in China.

Objective To identify the correlates of intentions to quit smoking among a representative sample of adult smokers in six cities in China.

Methods Data from wave 1 (2006) of the International Tobacco Control (ITC) Policy Evaluation Project China Survey, a face-to-face survey of adult Chinese smokers in six cities: Beijing, Shenyang, Shanghai, Changsha, Guangzhou and Yinchuan, was analysed. Households were sampled using a stratified multistage design. About 800 smokers were surveyed in each selected city (total n=4815).

Results Past quit attempts, duration of past attempts, Heaviness of Smoking Index (HSI), outcome expectancy of quitting, worry about future health and overall opinion of smoking were found to be independently associated with intentions to quit smoking, but demographic characteristics were not.

Conclusions The determinants of quit intentions among smokers in China are fairly similar to those found among smokers in Western countries, despite the fact that interest in quitting is considerably lower among Chinese smokers. Identifying the determinants of quit intentions provides possibilities for shaping effective policies and programs for increasing quitting among smokers in China.

INTRODUCTION

Currently, approximately 1.3 billion people smoke worldwide and, consequently, 5.4 million people die from tobacco use each year. Tobacco is now ranked as the world's leading killer, as it is a risk factor for six of the eight leading causes of death worldwide.¹ Though tobacco use is steadily declining in developed countries, smoking prevalence and cigarette consumption are increasing in developing countries.²⁻³ It is projected that tobacco use will kill up to 1 billion people during this century, of which 80% will be in developing countries.¹

As one of the largest developing countries, China is home to nearly one-third of the world's smokers:

a total of about 350 million. At present, an estimated 1 million deaths from smoking occur in China each year,⁴ and if current smoking rates continue, as many as 100 million people currently under the age of 30 in China will die from tobacco use. Thus, it is clear that tobacco control in China plays a critical role in global tobacco control efforts.

Smoking cessation is a priority for preventing smoking-attributable disease and reducing its burden.⁵⁻⁶ Quitting smoking at any age confers substantial and immediate health benefits, including reduced risks of stroke, cardiovascular disease and smoking-related cancers,⁶⁻⁹ and quitting smoking by the age of 30 reduces the risk of dying from tobacco-related diseases by almost 90%.¹⁰ The World Bank suggests that if adult cigarette consumption were to decrease by half in the year 2020, approximately 180 million tobacco-attributable deaths could be avoided.² Therefore, promotion of smoking cessation has been proposed as a primary focus of tobacco control efforts, especially in developing countries where smoking prevalence and cigarette consumption are both still relatively high.

According to stage-based models of behaviour change,¹¹ individual smokers must progress through several stages of behaviour change in order to quit smoking. They begin with no plan to stop smoking, then form an intention to quit, prepare themselves to quit, enact the new behaviour of quitting and finally maintain this behaviour. Having a quit intention is thus a prerequisite for preparing and taking action.¹²⁻¹³ Although having an intention to quit is not the only determinant of successful smoking cessation, it is strongly associated with making quit attempts and smoking cessation.¹⁴⁻¹⁵ In Western countries making quit attempts has been found to be associated with the following sociodemographics: being male,¹⁶ younger,¹⁴⁻¹⁷⁻¹⁹ well educated,¹⁹ and of white race.²⁰ The other reported correlates of quit attempts include level of nicotine dependence,¹⁴⁻¹⁸⁻²¹⁻²⁴ measures of motivation,¹⁴⁻²⁴⁻²⁵ self-efficacy,²⁶⁻²⁷ and past quit attempts.¹⁴⁻¹⁷⁻²⁵ China, as with many other developing countries, has little data on levels and correlates of smokers' intentions to quit. A national study on smoking behaviour conducted in 1996 found that smokers' self-reported health status, health concern, family opinions, as well as education and financial status were associated with their quitting behaviour.²⁸⁻²⁹ These are similar to the recent findings from the National Health Service Surveys.³⁰ Two studies conducted among



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medical workers, teachers, factory workers and secondary students in Hong Kong and mainland China found that being male, married and having high quitting self-efficacy were associated with the intention to quit smoking.^{31 32} However, to our knowledge, there are no population-based studies of intentions to quit smoking in China.

The purpose of this study was to examine the associations between intentions to quit smoking and a range of individual-level predictors, including measures of demographics, quitting history, nicotine dependence and motivation to quit.

METHODS

Data source

The International Tobacco Control (ITC)³⁰ Policy Evaluation Project China Survey is a prospective cohort survey conducted in six cities in China: Beijing, Shanghai, Guangzhou, Shenyang, Changsha and Yinchuan. (A seventh city (Zhengzhou) was dropped because of poor data quality.) These cities were selected based on geographical representations and levels of economic development. The target population of the ITC China Survey consists of smokers and non-smokers who are 18 years or older and are permanent residents who live in residential buildings in each of the six cities. Smokers are defined as those who have smoked at least 100 cigarettes in their lifetime and are currently smoking at least once a week. Within each city there was a random sample selected using a stratified multistage design, with inclusion probabilities proportional to size at the first few stages in each stratum. In each of the 6 cities, 10 Jie Dao (street districts) were randomly selected at the first stage, with probability of selection proportional to the population size of the Jie Dao. Within each selected Jie Dao, two Ju Wei Hui (residential blocks) were selected, again using probability proportional to the population size of the Ju Wei Hui. Within each selected Ju Wei Hui, a complete list of addresses of the dwelling units (households) was first compiled, and then a sample of 300 households was drawn from the list by simple random sampling without replacement. In the enumeration process, information on age, gender and smoking status for all adults living in these 300 households was collected. The enumerated 300 households were then randomly ordered, and adult smokers and non-smokers were then approached following the randomised order until 40 adult smokers and 10 non-smokers were surveyed. In each city, 800 smokers and 200 non-smokers were selected, so that the overall sample size of the survey is 4815 adult smokers and 1200 adult non-smokers. However, only smokers were included in the analyses for this paper. The wave 1 survey was conducted from February to April of 2006. The cooperation rates ranged from approximately 80.0% in Beijing and Guangzhou to 95.0% in Changsha, and the response rates ranged from 39.4% in Yinchuan to 66.0% in Guangzhou. Additional information about the ITC China survey methodology and sampling is provided by Wu *et al*³³ and available at <http://www.itcproject.org>.

The survey was conducted in Mandarin through face-to-face interviews. After providing the potential respondent with information about the survey and completion of the consent form, the average time to complete the survey was 31.4 min for smokers. A small gift worth about ¥10 was given to each participant as compensation. All materials and procedures used in the ITC China Survey were reviewed and cleared for ethics by the Research Ethics Boards at the University of Waterloo and The Cancer Council Victoria, and by the Institutional Review Boards at the China National Centers for Disease Control and Prevention.

Dependent variable

Intentions to quit were based on responses to the question: 'Do you plan to quit smoking?'. Subjects who selected 'in the next month', 'in the next 6 months' or 'sometime in the future after 6 months' were defined as having an intention to quit, and those who responded 'not at all' were defined as having no intention to quit. This measure was dichotomised for two reasons. First, our primary interest was not on the strength of the intention but rather whether people had an interest in quitting or not. Second, the frequency distribution of this measure was highly skewed with the majority being in the no intention category.

Independent variables

Sociodemographic variables were gender (female, male), age at survey (18–24=1, 25–39=2, 40–54=3, 55 and older=4), income (those with monthly household income less than ¥1000 were coded as 'low income', those between ¥1000–3000 were coded as 'medium income' and those equal or greater than ¥3000 were coded as 'high income', those who did not provide an answer to this question were coded as 'don't know'), education ('low education' levels were based on those who reported as either illiterate or having only primary school education, 'medium education' levels were those with high school or technical secondary school education and 'high education' levels were those with university or junior college education).

Motivational variables assessed were outcome expectancy of quitting, worries about health in the future, favourable attitudes towards smoking and overall opinion about smoking. Outcome expectancy of quitting was measured using the question: 'How much do you think you would benefit from health and other gains if you were to quit smoking permanently in the next 6 months?'. Response categories included: 'not at all', 'a little', 'very much' and 'don't know'. Worries about health in the future were measured by asking: 'How worried are you, if at all, that smoking will damage your health in the future?'. Response categories included: 'not at all', 'a little', 'very much' and 'don't know'. Favourable attitude towards smoking was measured by asking for rating of agreement with the statement: 'You enjoy smoking too much to give it up'. The variable was coded into a three-category variable because of small numbers for some categories: disagree (strongly disagree, disagree), neither disagree nor agree and agree (agree, strongly agree). Overall opinion about smoking was measured by asking: 'What is your overall opinion of smoking?'. This variable was also coded as a three-category variable because of small numbers for some categories: good (very good, good), neither good nor bad and bad (bad, very bad).

Quitting history variables assessed were: tried to quit smoking within last year (yes, no) and longest time off smoking (never, less than 1 month, between 1–6 months, 6 months or more, don't know).

Nicotine dependence was measured using the Heaviness of Smoking Index (HSI), which was based on the sum of two categorical variables: number of cigarettes smoked per day (scored as 0: 0–10 cigarettes per day (CPD), 1: 11–20 CPD, 2: 21–30 CPD, 3: >31 CPD) and time to first cigarette (scored as 0: >61 min, 1: 31–60 min, 2: 6–30 min, 3: 5 min or less).

Statistical analysis

For wave 1 data, the weights were simply calculated as the reciprocal of the inclusion probabilities, the final weight for a sampled individual was the number of people in the city population and the sampling category represented by that individual.³³ Unless otherwise indicated, data analyses were conducted on weighted data using SPSS V.17.0 Complex Survey

procedures (SPSS, Chicago, Illinois, USA). Logistic regression models were employed to determine the correlates of intentions to quit, first bivariate just between the dependent variable and each of the independent variables of interest, and then multivariately where the association between each independent variable and the dependent variable was adjusted for all other variables in the models. For multivariate analysis, all independent variables were entered into the multivariate logistic regression model to determine their independent effects. An α level of $p < 0.05$ was used to determine the level of statistical significance.

RESULTS

Table 1 shows the sample characteristics by city. Of the 4815 smokers interviewed, 4574 were men (95.0%) and 241 women (5.0%), with an average age of 50.1 years (SD=12.67). The 18–24 years age group was under-represented in our sample. The majority (95.0%) of the respondents were Han Chinese, with other ethnic groups accounting for the rest. Most of the subjects had a medium level of education (high school and technical secondary school, 65.5%). Almost half of the sample had an average family monthly income of ¥1000–3000 (48.4%), while those making more than ¥3000 or less than ¥1000 accounted for 30.5% and 21.1%, respectively. More than half of the smokers surveyed (53.1%) had attempted to quit smoking before, and almost one-quarter (23.6%) planned to quit.

Table 2 shows the results for univariate and multivariate analyses. The proportion of smokers with an intention to quit smoking was not significantly different across gender, age groups and income levels. Compared to smokers with a low education level, those with either a medium education level (OR 1.39, 95%

CI 1.00 to 1.92), or a high education level (OR 1.60, 95% CI 1.10 to 2.32) had significantly greater intentions to quit smoking, but the differences were no longer significant once we controlled for other covariates in the multivariate analysis. Smokers who had made a quit attempt within the last year and also those who had longer time off smoking were more likely to have an intention to quit smoking (significant in the univariate and multivariate analyses). However, smokers who scored higher on the HSI were less likely to have an intention to quit smoking in the univariate and multivariate analyses. Motivational variables, including greater perceived benefits from quitting, worry about the health effects of smoking, negative attitudes towards smoking and low overall opinion of smoking were found to be significantly associated with having an intention to quit in the univariate and multivariate analyses.

DISCUSSION

One key finding from this study is that the level of interest in quitting among Chinese smokers from the six cities studied was found to be generally low (ranging from 15% to 31%) and certainly considerably lower than that reported by Hyland *et al* in four developed countries in the West that ranged from 65% to 81%.³⁴ This finding underscores the need for greater effort to be made to stimulate interest in quitting among Chinese smokers in order to help China make significant inroad in reducing the health burden due to tobacco-related diseases.

Despite the low level of interest in quitting, consistent with the findings from Western countries,^{14 35 36} intentions to quit smoking among smokers from the six cities in China were found to be influenced by similar individual-level factors such as the HSI, a behavioural measure of nicotine dependence, past quitting behaviour and motivational variables.

Table 1 Sample characteristics by city

Variables	Total, n=4815	Beijing, n=804	Shenyang, n=801	Shanghai, n=801	Changsha, n=803	Guangzhou, n=804	Yinchuan, n=802
Ethnicity							
Han	95.0	94.5	94.9	98.6	98.6	99.3	84.2
Other	5.0	5.5	5.1	1.4	1.4	0.7	15.8
Gender							
Male	95.0	94.5	97.6	91.5	94.4	97.4	94.5
Female	5.0	5.5	2.4	8.5	5.6	2.6	5.5
Age							
18–24	1.4	2.0	1.6	1.0	1.7	0.9	1.1
25–39	17.6	13.6	12.6	10.5	23.4	14.0	31.5
40–54	49.4	47.4	57.9	57.8	45.3	44.4	43.4
≥55	31.6	37.0	27.9	30.7	29.6	40.7	24.0
Household income per month*							
Low (<¥1000)	19.6	9.3	31.5	14.3	28.3	12.1	22.1
Medium (¥1000–3000)	44.9	40.8	55.5	44.0	41.8	37.1	49.9
High (≥¥3000)	28.3	41.6	10.0	37.8	24.7	36.2	19.5
Don't know	7.3	8.2	3.0	4.0	5.2	14.7	8.5
Education							
Low	13.1	9.6	7.9	6.0	17.7	23.8	13.6
Medium	65.5	62.9	73.1	74.4	60.8	59.9	61.7
High	21.5	27.5	19.0	19.6	21.5	16.4	24.7
Ever tried to quit smoking							
No	46.9	48.6	48.8	59.8	40.8	44.4	38.8
Yes	53.1	51.4	51.2	40.3	59.2	55.6	61.2
Intention to quit							
No	76.4	75.3	69.2	83.6	74.4	85.1	71.1
Yes	23.6	24.7	30.8	16.4	25.6	14.9	28.9

*¥1=US\$0.1464 (as of 30 May 2010). Equivalent are low income: <US\$146, medium income: US\$146–439, high income: ≥US\$439.

Table 2 Individual-level factors associated with intentions to quit smoking

	n	Intention to quit(%)	Univariate analysis		Multivariate analysis	
			OR	95% CI	OR	95% CI
Gender						
Female	232	25.3	Reference		Reference	
Male	4481	24.3	0.95	0.56 to 1.61	0.81	0.43 to 1.54
Age						
18–24	66	29.6	Reference		Reference	
25–39	828	25.4	0.81	0.41 to 1.61	0.95	0.43 to 2.11
40–54	2330	24.6	0.77	0.35 to 1.69	1.08	0.44 to 2.64
≥55	1489	23.2	0.72	0.35 to 1.46	0.94	0.40 to 2.23
Household income per month						
Low (<¥1000)	923	22.8	Reference		Reference	
Medium (¥1000–3000)	2125	25.6	1.17	0.92 to 1.47	1.13	0.87 to 1.47
High (≥¥3000)	1323	25.5	1.16	0.87 to 1.54	1.29	0.94 to 1.77
Don't know	339	16.6	0.67	0.46 to 0.99	0.92	0.55 to 1.57
Education						
Low	619	19.1	Reference		Reference	
Medium	3085	24.7	1.39	1.00 to 1.92	1.21	0.84 to 1.74
High	1004	27.3	1.60	1.10 to 2.32	1.29	0.83 to 1.98
Tried to quit within last year						
No	3939	18.7	Reference		Reference	
Yes	777	51.0	4.52	3.74 to 5.45	2.29	1.81 to 2.89
Longest time quit smoking						
Never quit	2211	13.2	Reference		Reference	
Less than 1 month	1027	32.7	3.19	2.70 to 3.78	1.34	1.04 to 1.71
1–6 months	893	36.8	3.84	2.66 to 5.53	1.91	1.39 to 2.61
6 months or more	548	34.5	3.46	2.67 to 4.49	2.19	1.64 to 2.92
Don't know	30	22.3	1.89	0.78 to 4.56	1.90	0.66 to 5.49
HSI						
0–6	4381		0.83	0.79 to 0.88	0.87	0.82 to 0.93
Outcome expectancy of quitting (benefit from quitting in the next 6 months)						
Not at all	942	7.3	Reference		Reference	
A little	1523	21.0	3.37	2.25 to 5.05	2.14	1.41 to 3.25
Very much	1608	43.3	9.71	6.33 to 14.87	3.84	2.44 to 6.04
Don't know	638	7.7	1.06	0.65 to 1.73	1.01	0.60 to 1.70
Worried about health in the future						
Not at all	1634	8.5	Reference		Reference	
A little	1976	27.3	4.05	3.04 to 5.40	2.04	1.58 to 2.62
Very much	853	49.5	10.59	7.96 to 14.09	3.36	2.32 to 4.88
Don't know	249	13.6	1.70	0.99 to 2.92	1.54	0.85 to 2.76
Favourable attitudes about smoking						
Neither disagree nor agree	456	14.2	Reference		Reference	
Agree	2591	23.0	1.81	1.19 to 2.75	2.01	1.08 to 3.74
Disagree	1584	30.0	2.60	1.77 to 3.81	2.09	1.18 to 3.71
Overall opinion of smoking						
Neither good nor bad	1800	13.6	Reference		Reference	
Bad	2480	34.9	3.42	2.87 to 4.07	1.70	1.33 to 2.16
Good	315	6.4	0.44	0.27 to 0.72	0.66	0.40 to 1.09

Bold values indicate a significant difference at $p < 0.05$.
HSI, Heaviness of Smoking Index.

The majority of previous studies have shown that demographic characteristics such as gender, age, income and education are associated with making serious quit attempts and smoking cessation,^{15 17–19 37–39} but the relation between demographic characteristics and intentions to quit smoking are not always consistent.^{29 36 40 41} In our study, quitting intention was not independently associated with age, income and education levels. The lack of an independent effect for education might be because it was confounded with other variables in the model, such as the HSI, which has been shown previously to be associated with socioeconomic status.⁴² The lack of demographic differences in quit intentions might also reflect cultural differences,⁴¹ a possibility that awaits further research. A recently

published study which used data from China National Health Service Surveys conducted in 1993, 1998 and 2003 found that quitting increased with age among Chinese smokers, and a considerable proportion of former smokers (40.6%) quit because of illness.³⁰ As mentioned earlier, a cross-sectional study among Hong Kong Chinese smokers conducted by Abdullah and Yam found that being male was associated with intention to quit,³¹ but this was not found in our study. One possible reason for this difference is the small sample size of our study, especially for women smokers (Abdullah and Yam's study had a much bigger sample size; 11700 persons were included). Another possible explanation for the difference in predictors of intention to quit between the Hong Kong and mainland Chinese smokers

could be the difference in tobacco control culture in Hong Kong versus mainland China. Compared to mainland China, Hong Kong has a much longer history in tobacco control. It has had well implemented smoke-free policies in workplaces and public venues, and much more substantial anti-smoking campaigns and cessation services. Compared to smokers in this study, the Hong Kong Chinese smokers had a much higher rate of intention to quit; of the daily smokers, 52% intended to quit.³¹

Previous research in the West has found that nicotine dependence is a significant barrier to making quit attempts and smoking cessation.^{14 15 36} Using intentions to quit as an outcome variable, we found a similar negative relation, that is, the higher the level of nicotine dependence, the lower the willingness to quit. This finding suggests that cessation strategies should be tailored to the smoker's level of nicotine dependence. Smokers with low dependence should be encouraged to make quit attempt. Smokers with higher nicotine dependence should be treated with interventions that help to reduce consumption in order to increase their chances of being able to quit successfully in the future.^{43–45}

Consistent with the findings from Western countries showing that past quitting experiences are associated with subsequent quitting attempts,^{14 35} we found the same factor predicted intentions to quit smoking. This suggests that smokers without a quit history may have no intention to quit, and thus brief interventions can be designed to stimulate motivation to quit smoking among this group. Brief interventions involve opportunistic advice, discussion, negotiation or encouragement. They are often delivered by a range of primary and community care professionals. For smoking cessation, brief interventions typically take between 5–10 min.⁴⁶ Given that successful quitting requires repeated interventions and multiple attempts to quit,⁴⁷ professional counselling and medical treatments should also be provided to increase the chances of successful quitting. However, cessation services and quitting medications (eg, nicotine replacement therapy medications) are not generally available in China, especially in rural areas. Efforts need to be made to train doctors and health professionals in providing brief cessation interventions or making referrals to cessation services.^{30 48}

Our finding of an independent effect of motivational variables on quit intentions is consistent with the evidence from other studies including national surveys in China, which show that major reasons for quitting include present illness^{29 49} and future health concerns.^{50 51} Misconceptions and lack of awareness of health risks are common among Chinese smokers,⁵² so public education campaigns are needed to increase smokers' awareness of the health harms of smoking, which in turn can increase their interest in quitting.

Smokers' intentions to quit smoking are also clearly influenced by their attitudes towards smoking. Smoking is common in China, especially among men. Many regard smoking and exchanging cigarettes as a normal part of life.⁵³ Consequently, there is a critical need to change the social acceptability of smoking in order to change the attitudes of smokers towards smoking. Health warnings on cigarette packaging are one of the most cost-effective approaches in communicating the harms of smoking to smokers, and where pictorial warnings are used, they will have even stronger effects, especially among those with low literacy.¹ However, China currently uses only text-based warnings that have been proven to be ineffective, so the implementation of pictorial warnings should be advocated.

This study has some limitations. One limitation is the use of respondent reports to provide information, which may be subject to recall bias and social desirability. Furthermore, survey

What this paper adds

- ▶ Interest in quitting is considerably lower among Chinese smokers.
- ▶ Individual-level factors such as past quit attempts, duration of past attempts, Heaviness of Smoking Index (HSI), outcome expectancy of quitting, worry about future health and overall opinion of smoking were found to be independently associated with intentions to quit smoking.
- ▶ Demographic characteristics were not associated with intentions to quit smoking.

response rates in the first wave were moderate to low, therefore, the findings are limited by potential non-response differentials. Socioeconomic variables were relatively difficult to measure (as a construct and its relationship to health and disease factors), and certain measures in our data (ie, income) had a large proportion of 'unknown' responses, which potentially limited the findings. In addition, our survey was limited to urban areas (ie, six selected cities) that are inhabited mainly by the Han ethnic Chinese. In reality, the vast majority of the Chinese smoking population still live in rural areas, where they have a higher smoking prevalence.^{30 49} Therefore, caution needs to be exercised to generalise the findings to rural areas and/or minority ethnic groups.

Data analysed in this paper are from the first wave of the ITC China survey, and so causal directionality is somewhat unclear. With the subsequent waves of the data, we will be able to examine prospectively the predictors of making quit attempts. In addition to individual factors, social environmental factors may also be important drivers of quitting and these will be examined in future papers. It is reassuring that the findings from this study are generally consistent with those from the Western countries despite the linguistic and/or cultural differences which could potentially affect the interpretation of survey questions, including factors associated with intentions to quit.

In summary, like their Western counterparts, interest in quitting among smokers from six cities in China is influenced by similar individual-level factors such as past quitting experiences, nicotine dependence, health concerns and their attitudes towards smoking, underscoring the need to consider these factors when designing cessation intervention programs to ensure that they are effective.

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Competing interests None.

Patient consent Obtained.

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Contributors All authors made significant contributions to different versions of the manuscript.

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中国六城市影响成年吸烟者戒烟意愿的个人水平因素：ITC中国调查结果

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摘要

背景：中国有3亿5千多万吸烟者，占全世界吸烟总人数的近三分之一。戒烟对于减少烟草危害、降低吸烟相关疾病至关重要，因此，确定影响中国吸烟者戒烟和戒烟意愿的因素是一项十分重要的工作，其结果可以指导中国未来的烟草控制政策和项目，提高戒烟率。

目的：确定影响中国6个城市成人吸烟者代表性样本戒烟意愿的相关因素。

方法：分析国际烟草控制政策评价项目（ITC）中国第一轮调查（2006年）中成年吸烟者面对面调查数据，6个城市包括：北京、沈阳、上海、长沙、广州和银川。采取分层多阶段抽样设计抽取调查家庭。每个城市约调查800名吸烟者（总数为4815）。

结果：研究发现，既往戒烟尝试、既往戒烟尝试维持时间、吸烟强度指数（HSI）、戒烟预期结局、对未来健康的担心和对吸烟的总体看法与戒烟意愿相关，而人口学特征与戒烟意愿不相关。

结论：除了中国吸烟者的戒烟意愿比例较低，影响戒烟意愿的因素与西方国家吸烟者相似。确定戒烟意愿的影响因素有助于制订有效的控烟政策，促进更多的中国吸烟者戒烟。

前言

目前全球大约有13亿吸烟者，每年有540万人死于烟草使用。烟草是当今世界头号致死因素，它是全球前八位死因当中六个的危险因素。¹虽然烟草使用在发达国家已呈稳步下降之势，但是发展中国家的吸烟率和烟草消费却仍在不断增长。²⁻³据预测，本世纪死于烟草使用的人数将高达10亿，其中80%都会发生在发展中国家。¹

中国作为全世界最大的发展中国家之一，其吸烟者人数占了全球吸烟者总人数将近三分之一——约3.5亿。目前，估计中国每年死于吸烟的人数高达100万，⁴如果现有吸烟率维持不变，目前中国年龄在30岁以下的人口当中将有1亿死于烟草使用。因此，中国的烟草控制对于全球烟草控制具有极其关键性的作用。

戒烟是预防吸烟相关疾病，降低相应疾病负担的一项重要措施。⁵⁻⁶在任何年龄戒烟都可以很快获得显著的健康收益，包括降低中风、心血管疾病和吸烟相关癌症的风险，⁶⁻⁹同

时，30岁以前戒烟还可以使烟草相关疾病的死亡风险降低将近90%。¹⁰世界银行研究显示，如果2020年成年人烟草消费量可以减半，那么将能够避免约1.8亿烟草导致的死亡。²因此，促进戒烟被认为是那些吸烟率和烟草消费量都相对较高的发展中国家烟草控制工作中的核心内容之一。

根据阶段行为改变模型，¹¹吸烟者须经过几个行为变化阶段才能最终戒烟。首先是不打算戒烟的阶段，而后是形成戒烟意愿，准备戒烟，采取行动开始戒烟，最后一个阶段是维持戒烟行为。因此，具有戒烟意愿是准备戒烟和采取具体行动的前提条件。¹²⁻¹³虽然有戒烟意愿并不是成功戒烟唯一的决定因素，但它与进行戒烟尝试和戒烟之间有着十分显著的联系。¹⁴⁻¹⁵在西方国家，研究发现与戒烟意愿有关的社会人口因素包括：男性、¹⁶年轻、¹⁴⁻¹⁷⁻¹⁹受教育程度高¹⁹以及属于白种人。²⁰其它一些报道的与戒烟尝试有关的因素还包括尼古丁依赖程度、¹⁴⁻¹⁸⁻²¹⁻²⁴动机指标、¹⁴⁻²⁴⁻²⁵自我效能、²⁶⁻²⁷既往戒烟尝试。¹⁴⁻¹⁷⁻²⁵和其它很多发展中国家一样，中国关于吸烟者戒烟意愿的水平和相关因素数据十分有限。1996年开展的一次全国吸烟行为调查发现，吸烟者的戒烟行为与其自报健康状况、对自己的健康担心、家人意见以及教育和经济状况有关。²⁸⁻²⁹这些结果与近期开展的全国卫生服务调查结果基本一致。³⁰另外两项针对香港和大陆医务工作者、教育工作者、工厂工人和中学生的研究结果显示，男性、已婚以及较高的戒烟自我效能与戒烟意愿之间存在相关性。³¹⁻³²但是，据我们所知，目前尚没有中国人群戒烟意愿的研究报道。

本研究的目的是要探讨戒烟意愿与一系列个人层面预测指标之间的联系，包括人口学指标、戒烟史、尼古丁依赖程度以及戒烟动力。

方法

数据来源

国际烟草控制政策评估项目（ITC）³³中国调查是一项在中国6个城市开展的前瞻性人群调查，包括北京、上海、广州、沈阳、长沙和银川六座城市。（另外还有一个城市（郑州）由于数据质量问题被剔除）这些城市选择的依据是其地理代表性和经济发展水平。ITC中国调查的目标人群包括六个城市年龄在18岁或以上，吸烟或非吸烟的常住居民。吸烟者的定义是曾吸烟超过100支，且目前至少每周吸烟一次的人。

6 解锁

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每个城市使用多阶段分层设计随机抽样, 入选概率与前几个抽样阶段每一层的人口比例成正比。第一阶段在每个城市随机选择10个街道, 入选概率与街道人口成正比。在每个抽中的街道内选择2个居委会, 同样入选概率与每个居委会的人口比例成正比。在每个抽中居委会当中, 首先编制一份居住单位(家庭)的地址全表, 然后采用不放回简单随机抽样的方式抽取300户家庭样本。在随后的信息收集过程中收集所有300户家庭中成年人的年龄、性别和吸烟状况信息。然后将收集过信息的300户家庭随机排序, 对其中的成年吸烟者和非吸烟者进行调查, 直到40名成年吸烟者和10名非吸烟者的调查配额达到为止。每个城市分别抽取800名吸烟者和200名非吸烟者, 调查总样本量为4815名成年吸烟者和1200名成年非吸烟者。本论文仅包含了其中的吸烟者部分。第一轮调查的时间是2006年4月至8月, 其中合作率范围从北京约80.0%到长沙95.0%, 应答率范围从银川的39.4%到广州的66.0%。Wu³³等人对ITC中国调查的方法学和抽样技术另有详细介绍, 可参见网址: <http://www.itcproject.org>。

ITC中国调查采取的是普通话面对面访谈。在向调查对象介绍了调查的相关信息、调查对象签署知情同意书之后开始调查, 平均完成时间是吸烟者31.4分钟。每位调查对象在完成调查后可获得一份约价值10元的小礼物。ITC中国调查中的所有材料和程序均经过滑铁卢大学和维多利亚省癌症委员会研究伦理委员会以及中国疾病预防控制中心伦理委员会进行伦理审批。

因变量

是否有戒烟意愿是根据下列问题的回答来判断: “你打算戒烟吗?” 选择“下个月之内”、“接下来的6个月中”或者“6个月以后的某一天”的调查对象被认定为具有戒烟意愿, 选择“没打算戒烟”的调查对象被认为不具有戒烟意愿。对这一指标这样进行二分类有两个原因: 首先, 我们的主要意图不是了解戒烟意愿的强度, 而是确定人们是否有兴趣戒烟; 第二, 这一指标的频率分布高度偏向于无戒烟意愿的方向。

自变量

社会人口学变量包括: 性别(男性、女性)、调查时年龄(18-24岁=1, 25-39岁=2, 40-54岁=3, 55岁及以上=4)、收入(家庭月收入少于1000元的编码为“低收入”, 1000-2999元的为“中等收入”, 3000元或以上的为“高收入”, 没有回答该问题的为“不知道”)、教育(“低教育”水平包括自报文盲或者仅有小学教育程度的对象, “中等教育”水平包括具有中学或中专教育水平的对象, “高等教育”水平包括具有大学或大专以上教育水平的对象)。

动机变量包括对戒烟结果的期望、对未来健康的担忧、对吸烟喜爱的态度和对于吸烟的总体看法。测定戒烟结果期望采用的问题是: “如果你在接下来的6个月中彻底戒烟, 你认为在健康及其他方面会有多大收益?” 答案类别包括“一点也不”、“有点”、“很大”和“不知道”。测定对未来健康担忧的问题是: “你是否担心吸烟会损害你今后的健康?” 答案类型包括“一点也不”、“有点担心”、“很担心”和“不知道”。对关于吸烟喜爱的态度是通过请调查对象选择对下列陈述同意的程度进行测定: “因为吸烟是一种享受, 所以没法戒掉”。由于选择个别选项的人数很少, 此变量编码分为了三类: “反对(非常反对、反对)”、“无所谓”和“支持(支持、非常支持)”。测定关于吸烟的总体看法的问题是: “你对吸烟的总体

看法是什么?” 由于选择个别选项的人数很少, 这一变量也分成了三类“好(很好、好)”、“不好也不坏”和“不好(不好、非常不好)”。

戒烟史方面的变量包括: “在过去的一年内尝试戒烟(是、否)”、“最近一次戒烟的持续时间(从来没有、少于一个月、1-6个月、6个月以上、不知道)”。

对尼古丁依赖的测定使用的是吸烟强度指数(HSI), 使用2个变量求和得出: 每日吸烟支数(0: 0-10支烟/天; 1: 11-20支烟/天; 2: 21-30支烟/天; 3: >31支烟/天), 以及起床后吸第一支烟的时间(0: >60分钟; 1: 31-60分钟; 2: 6-30分钟; 3: 5分钟以内)。

数据分析

对于第一轮数据, 权重的计算仅仅是求入选概率的倒数, 调查对象的最终权重是该个人所代表的该市此抽样类别中的人数。³³ 除非另有说明, 加权后的数据使用SPSS V.17.0 Complex Survey 程序分析(SPSS, 芝加哥, 伊利诺伊, 美国)。使用Logistic回归模型对戒烟意愿相关因素进行分析, 首先对因变量和每个自变量进行二元回归分析, 然后进行多元回归分析, 此时各自变量和因变量之间的联系对模型中所有其它变量进行了调整。在多元回归分析中, 所有自变量都纳入多元回归模型, 分析其各自效果。统计学显著性判断标准为 $p < 0.05$ 。

结果

表1当中是分城市的样本特征信息。在调查的4815名吸烟者当中, 4574人为男性(95.0%), 241人为女性(5.0%), 平均年龄50.1岁(SD=12.67)。18-24岁年龄组样本量相对较低。调查对象当中大多数为汉族(95.0%), 剩余部分为少数民族。调查对象大部分为中等教育水平(中学及中专, 65.5%)。接近一半的样本家庭平均月收入在1000-3000元之间(48.4%), 超过3000元和不到1000元的比例分别为30.5%和21.1%。超过一半的吸烟者(53.1%)以前曾经尝试过戒烟, 接近四分之一的吸烟者(23.6%)打算戒烟。

表2中是单变量分析和多变量分析的结果。各性别、年龄组、收入水平之间的具有戒烟意愿的吸烟者比例并不存在显著差异。与低教育水平吸烟者相比, 中等教育水平(OR=1.39, 95%CI: 1.00-1.92)和高教育水平(OR=1.60, 95%CI: 1.10-2.32)调查对象的戒烟意愿明显较高, 但是当在多元分析中控制了其它协变量之后, 这种差异就不再具有显著性了。过去一年曾经尝试戒烟和戒烟持续时间较长的吸烟者具有戒烟意愿的可能性也较大(在单变量分析和多变量分析当中均具有显著性)。然而, 单变量分析和多变量分析发现, HSI值较高的吸烟者具有戒烟意愿的可能性较低。单变量分析和多变量分析结果显示, 对戒烟有益结果的期望, 对吸烟健康危害的担心, 对吸烟的负面态度更加强烈以及对吸烟的总体看法更差都与有戒烟意愿之间存在显著的关联。

讨论

本研究的一个重要发现是, 中国这六个城市的吸烟者对戒烟感兴趣的程度总体都较低(15%-31%), 明显比Hyland等人报道的四个西方发达国家水平(65%-81%)低。³⁴ 这一发现表明, 还要采取更多努力, 激起中国吸烟者对戒烟的兴趣, 从而帮助中国在降低烟草相关疾病负担方面取得进

表1: 分城市样本特征

变量	总数 n=4815	北京 n=804	沈阳 n=801	上海 n=801	长沙 n=803	广州 n=804	银川 n=802
民族							
汉	95.0	94.5	94.9	98.6	98.6	99.3	84.2
其他	5.0	5.5	5.1	1.4	1.4	0.7	15.8
性别							
男	95.0	94.5	97.6	91.5	94.4	97.4	94.5
女	5.0	5.5	2.4	8.5	5.6	2.6	5.5
年龄							
18-24	1.4	2.0	1.6	1.0	1.7	0.9	1.1
25-39	17.6	13.6	12.6	10.5	23.4	14.0	31.5
40-54	49.4	47.4	57.9	57.8	45.3	44.4	43.4
≥55	31.6	37.0	27.9	30.7	29.6	40.7	24.0
家庭平均月收入*							
低 (<1000)	19.6	9.3	31.5	14.3	28.3	12.1	22.1
中等 (1000-3000)	44.9	40.8	55.5	44.0	41.8	37.1	49.9
高 (≥3000)	28.3	41.6	10.0	37.8	24.7	36.2	19.5
不知道	7.3	8.2	3.0	4.0	5.2	14.7	8.5
教育							
低	13.1	9.6	7.9	6.0	17.7	23.8	13.6
中等	65.5	62.9	73.1	74.4	60.8	59.9	61.7
高	21.5	27.5	19.0	19.6	21.5	16.4	24.7
曾经尝试戒烟							
否	46.9	48.6	48.8	59.8	40.8	44.4	38.8
是	53.1	51.4	51.2	40.3	59.2	55.6	61.2
打算戒烟							
否	76.4	75.3	69.2	83.6	74.4	85.1	71.1
是	23.6	24.7	30.8	16.4	25.6	14.9	28.9

* 1人民币=0.1464美元 (2010年5月30日), 低收入 < 146美元, 中等收入: 146-439美元, 高收入 ≥ 439美元。

一步显著的进展。尽管吸烟者戒烟的兴趣水平不高, 但与西方国家研究结果^{14 35 36}一致的是, 中国六个城市吸烟者的戒烟意愿也受到类似的个人因素影响, 包括HSI (尼古丁依赖的行为指标)、既往戒烟行为和动机因素等。

以往研究大都认同性别、年龄、收入和教育水平等人口学特征与认真尝试戒烟和戒烟成功之间具有关联,^{15 17-19 37-39}但是对于人口学特征和戒烟意愿之间的关系却并不一致。^{29 36 40 41} 本研究发现, 戒烟意愿与年龄、收入和教育水平之间并没有独立的联系。教育水平没有独立的影响可能是由于在模型中受到了其它变量的干扰, 比如HSI在以往的研究中就发现与社会经济状况相关。⁴²不同人口学特征的人群在戒烟意愿方面不存在差异, 可能是文化差异的一个反映,⁴¹但这个观点尚需进一步研究。近期发表的一个使用1993、1998和2003年中国全国卫生服务调查数据指出, 中国吸烟者戒烟比例随年龄增长而增加, 同时戒烟者当中很大比例 (40.6%) 是因为生病才戒烟。³⁰上面我们到, Abdullah和Yam对香港吸烟者进行的一项横截面研究显示性别与戒烟意愿之间具有联系,³¹但是我们的研究并没有得出这个结论。对于这一差异一个可能的原因是因为我们的研究样本太小, 特别是对于女性吸烟者 (Abdullah和Yam的研究样本规模大很多, 纳

入了11700人), 另一个可能的解释是中国大陆和香港的烟草控制氛围不同, 从而导致两地吸烟者的戒烟意愿存在差异。与中国大陆相比, 香港在烟草控制领域的历史长得多, 并且已经实施了工作场所和公共场所无烟化的政策, 同时还具有规模大得多的反烟行动和戒烟服务。和本研究中的吸烟者相比, 香港吸烟者中有戒烟意愿的比例高很多——每日吸烟者中52%有戒烟意愿。³¹

以往西方国家的研究发现, 尼古丁依赖对戒烟尝试和成功戒烟是一大障碍。^{14 15 36} 将戒烟意愿作为结局变量, 我们已发现了类似的负面联系, 即尼古丁依赖水平越高, 戒烟意愿越低。这一结果提示, 戒烟策略应当按照吸烟者的尼古丁依赖水平制定。对依赖水平较低的吸烟者要鼓励他们尝试戒烟, 对依赖水平较高的应该采取干预措施, 帮助他们减少使用量, 从而提高他们以后成功戒烟的机会。^{43 45}

西方国家的一些研究结果显示, 既往戒烟经验与后来的戒烟尝试之间存在联系,^{14 35}我们的研究在预测戒烟意愿方面也得出了一致的结果。这表明没有既往戒烟史的吸烟者可能没有戒烟的意愿, 因此可以设计简短的戒烟干预措施, 激发这一人群的戒烟动机。简短干预措施包括适时建议、讨论、商议和鼓励, 这些干预措施常常可以通过初级医疗服务和

表2: 与戒烟意愿有关的个人水平因素

	例数	戒烟意愿 (%)	单变量分析		多变量分析		
			OR	95%CI	OR	95%CI	
性别							
女	232	25.3	Ref		Ref		
男	4481	24.3	0.95	0.56~1.61	0.81	0.43~1.54	
年龄							
18-24	66	29.6	Ref		Ref		
25-39	828	25.4	0.81	0.41~1.61	0.95	0.43~2.11	
40-54	2330	24.6	0.77	0.35~1.69	1.08	0.44~2.64	
≥55	1489	23.2	0.72	0.35~1.46	0.94	0.40~2.23	
家庭平均月收入							
低 (<1000)	923	22.8	Ref		Ref		
中等 (1000-3000)	2125	25.6	1.17	0.92~1.47	1.13	0.87~1.47	
高 (≥3000)	1323	25.5	1.16	0.87~1.54	1.29	0.94~1.77	
不知道	339	16.6	<u>0.67</u>	0.46~0.99	0.92	0.55~1.57	
教育							
低	619	19.1	Ref		Ref		
中等	3085	24.7	<u>1.39</u>	1.00~1.92	1.21	0.84~1.74	
高	1004	27.3	<u>1.60</u>	1.10~2.32	1.29	0.83~1.98	
在过去的一年内尝试戒烟							
否	3939	18.7	Ref		Ref		
是	777	51.0	<u>4.52</u>	3.74~5.45	<u>2.29</u>	1.81~2.89	
最近一次戒烟的持续时间							
从来没有	2211	13.2	Ref		Ref		
少于一个月	1027	32.7	<u>3.19</u>	2.70~3.78	<u>1.34</u>	1.04~1.71	
1-6个月	893	36.8	<u>3.84</u>	2.66~5.53	<u>1.91</u>	1.39~2.61	
6个月以上	548	34.5	<u>3.46</u>	2.67~4.49	<u>2.19</u>	1.64~2.92	
不知道	30	22.3	1.89	0.78~4.56	1.90	0.66~5.49	
吸烟强度指数 (HSI)							
0-6	4381		<u>0.832</u>	0.790~0.876	<u>0.871</u>	0.817~0.929	
戒烟结果期望 (你觉得在未来半年内彻底戒烟对你的健康和其它方面会带来多少益处?)							
完全没有益处	942	7.3	Ref		Ref		
有一点	1523	21.0	<u>3.37</u>	2.25~5.05	<u>2.14</u>	1.41~3.25	
很多	1608	43.3	<u>9.71</u>	6.33~14.87	<u>3.84</u>	2.44~6.04	
不知道	638	7.7	1.06	0.65~1.73	1.01	0.60~1.70	
担心今后的健康							
不担心	1634	8.5	Ref		Ref		
有点担心	1976	27.3	<u>4.05</u>	3.04~5.40	<u>2.04</u>	1.58~2.62	
非常担心	853	49.5	<u>10.59</u>	7.96~14.09	<u>3.36</u>	2.32~4.88	
不知道	249	13.6	1.70	0.99~2.92	1.54	0.85~2.76	
对吸烟的喜爱的态度							
不支持也不反对	456	14.2	Ref		Ref		
支持	2591	23.0	<u>1.81</u>	1.19~2.75	<u>2.01</u>	1.08~3.74	
反对	1584	30.0	<u>2.60</u>	1.77~3.81	<u>2.09</u>	1.18~3.71	
对吸烟的总体看法							
不好也不坏	1800	13.6	Ref		Ref		
坏	2480	34.9	<u>3.42</u>	2.87~4.07	<u>1.70</u>	1.33~2.16	
好	315	6.4	<u>0.44</u>	0.27~0.72	0.66	0.40~1.09	

下划线表明在P < 0.05水平有显著差异。HSI: 吸烟强度指数。

社区医疗服务提供者实施。简短戒烟干预一般只需要5-10分钟。⁴⁶ 由于成功戒烟需要反复干预和多次尝试,⁴⁷因此还需要提供专业咨询和治疗,以提高成功戒烟的机会。中国戒烟服务和药物治疗(如尼古丁替代药物治疗)并不普及,特别是在农村地区,因此需要采取措施,培训医生和其他医疗工作者提供简短戒烟干预或者戒烟服务转诊。^{30 48}

我们发现动机变量对戒烟意愿的独立效应与其它研究得出的证据是一致的,包括中国的全国性调查发现戒烟的主要原因包括当前患病^{29 49}和对未来健康的担心。^{50 51} 中国吸烟者对于吸烟的健康危害存在很多错误认识或者缺乏相应认识,⁵²因此需要开展公共教育行动,提高吸烟者对吸烟健康危害的认识,从而提高他们戒烟的兴趣。

吸烟者的戒烟意愿还明显受到他们对于吸烟的态度的影响。在中国,吸烟是一种十分普遍的现象,特别是在男性当中。很多人将吸烟和互相敬烟看作是生活的正常组成部分。⁵³ 因此急需改变社会对于吸烟的这种认同,从而改变吸烟者对于吸烟的态度。烟草包装上的健康警示信息是宣传吸烟对吸烟者危害的最重要手段之一,如果使用了图片信息,那么对吸烟者,特别是文化程度较低的人群,其效果更佳。¹ 然而,目前中国使用的警示信息仅是文字性的,这种方式经证实效果很差,因此需要倡导使用图片信息。

本研究尚存在一些局限性。其中一个使用调查对象的报告信息作为信息来源,这种方式可能受到回忆偏倚和社会期望的影响。此外,第一轮调查应答率从中等到低水平不等,因此结果可能受到无应答偏倚的限制。社会经济变量(作为一个概念和它与健康、疾病因素之间的关系)测量起来相对比较困难,同时我们的数据中个别指标(收入)很大部分回答都是“不知道”,这也限制了我们的结果。除此之外,我们的调查工作仅限于城市地区(6个选择城市),其居民主要是汉族,而实际上,中国大部分吸烟人口都居住在农村地区,其吸烟率水平更高。^{30 49} 因此,将本研究的结果用于农村地区或者少数民族时必须十分谨慎。

本文中所分析的数据都来自ITC中国调查第一轮调查结

研究贡献

中国吸烟者戒烟意愿水平很低

个人层次的因素,例如既往戒烟尝试、既往戒烟尝试维持时间、吸烟强度指数(HSI)、戒烟预期结局、对未来健康的担心和对吸烟的总体看法与戒烟意愿相关。

人口学特征与戒烟意愿不相关。

果,因此因果关系还存在一定的不确定性。在使用后面几轮的调查数据之后,我们将能够对戒烟尝试的预测因素进行前瞻性分析。除了个人因素外,社会环境因素也可能成为戒烟的重要动力,这些部分我们将在今后的文章中进一步探讨。尽管存在语言和/或文化方面的诸多差异,可能影响对调查问题的解读,包括与戒烟意愿相关的因素,但我们欣慰地看到,这次研究的结果总体上依然同西方国家的研究结果是一致的。

总之,和西方国家吸烟者一样,中国六个城市吸烟者的戒烟兴趣都受到了类似个人层面因素的影响,譬如既往戒烟经验、尼古丁依赖程度、健康顾虑,以及他们对于吸烟的态度等,因此,我们有必要在设计戒烟干预项目的时候考虑到这些因素,从而确保项目的有效性。

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