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Smokers' sensory beliefs mediate the relation between smoking a 'light/low tar' cigarette and perceptions of harm

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Abstract

Background—The sensory belief that 'light/low tar' cigarettes are smoother can also influence the belief that 'light/low tar' cigarettes are less harmful. However, the 'light' concept is one of several factors influencing beliefs. No studies have examined the impact of the sensory belief about one's own brand of cigarettes on perceptions of harm.

Objective—The current study examines whether a smoker's sensory belief that their brand is smoother is associated with the belief that their brand is less harmful and whether sensory beliefs mediate the relation between smoking a 'light/low tar' cigarette and relative perceptions of harm among smokers in China.

Methods—Data are from 5209 smokers who were recruited using a stratified multistage sampling design and participated in wave 3 of the International Tobacco Control (ITC) China Survey, a face-to-face survey of adult smokers and non-smokers in seven cities.

Results—Smokers who agreed that their brand of cigarettes was smoother were significantly more likely to say that their brand of cigarettes was less harmful ($p<0.001$, OR=6.86, 95% CI 5.64 to 8.33). Mediational analyses using the bootstrapping procedure indicated that both the direct effect of 'light/low tar' cigarette smokers on the belief that their cigarettes are less harmful ($b=0.24$, bootstrapped bias corrected 95% CI 0.13 to 0.34, $p<0.001$) and the indirect effect via their belief that their cigarettes are smoother were significant ($b=0.32$, bootstrapped bias-corrected 95% CI 0.28 to 0.37, $p<0.001$), suggesting that the mediation was partial.

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Conclusions—These results demonstrate the importance of implementing tobacco control policies that address the impact that cigarette design and marketing can have in capitalising on the smoker's natural associations between smoother sensations and lowered perceptions of harm.

INTRODUCTION

Despite evidence that 'light/low tar' cigarettes are just as harmful as 'regular' cigarettes,[12] many smokers continue to believe that these cigarettes are less harmful.[3–6] Descriptors such as 'light', or 'mild', and features of the cigarette package, including shape, colours, numbers or symbols are used to convey information about the relative health risks associated with a particular brand.[78] To deter misperceptions of risk, bans on misleading descriptors such as 'light' and 'mild' have been implemented by 95 countries to date in accordance with Article 11 of the WHO Framework Convention on Tobacco Control (FCTC).[9] However, research suggests that these bans are not sufficient.[1011]

One potential limitation of these bans is that they fail to address other important characteristics of the cigarette and package designs that also create erroneous risk perceptions. Sensory beliefs are used as indicators of relative harm.[12] A key factor associated with the belief that 'light/low tar' cigarettes are less harmful is the belief that these cigarettes are smoother.[361314] Cigarettes labelled with a 'smooth' descriptor (not covered under these bans) are perceived to be less harmful.[78] Experimental research has demonstrated that addressing perceptions of the smoothness of 'light' cigarettes appears to be the most effective way to change smokers' perceptions about the relative harm of 'light' cigarettes.[14]

Existing research focuses on beliefs about the smoothness and harm of 'light' cigarettes. Focusing on 'light' descriptors alone is limited because cigarettes in many countries are no longer labelled with these explicit descriptors. Moreover, 'light' descriptors are one of several factors that reinforce the belief that a particular cigarette is smoother, including: the physical engineering of the cigarette (eg, filter ventilation),[1516] nicotine levels,[17] lighter package colour,[18–20] softer packaging,[20] pack shape (eg, rounded corners)[21] and descriptors such as 'smooth' or 'silver' on the cigarette packaging.[18]

The issue of whether the smoker's own sensory perceptions of the cigarettes they smoke relate to the belief that their particular brand of cigarettes is less harmful is important and warrants further study. The current study is an extension of the existing research demonstrating a link between the belief that 'light' and 'low tar' cigarettes are smoother and the belief that 'light' and 'low tar' cigarettes are less harmful among smokers in China.[13] The study focuses on how Chinese smokers' perception of their own brand of cigarettes relates to the belief that their cigarette is less harmful. It is particularly important to improve tobacco control research efforts in China because it has the largest consumption of cigarettes in the world.[22] China banned descriptors such as 'light', 'mild' or 'low tar' on cigarette packages in January 2006 in accordance with Article 11 of the WHO FCTC. However, marketing 'low tar' cigarettes as less harmful has been and continues to be one of the key strategies to counter tobacco control in China.[23] Initiatives have included: developing lower

tar cigarettes, regulating increasingly lower maximum tar thresholds, and conducting research to purportedly demonstrate that these lower tar cigarettes are less harmful.[23–25]

A high proportion of smokers in China continue to believe that 'light/low tar' cigarettes are less harmful.[1322] The factor most strongly associated with belief that 'light/low tar' cigarettes are less harmful was the belief that these cigarettes were smoother.[13] Use of 'low tar' cigarettes is also on the rise as more smokers in China become health concerned and as maximum tar levels are decreased.[25] Lower tar yields are accomplished mainly by increasing the filter ventilation in cigarettes,[26] and filter ventilation is a significant contributor to the perception that a brand is smoother.[16] An increasing number of smokers in China are therefore smoking cigarettes that may feel smoother due to the increased filter ventilation. Thus, examining how sensory beliefs relate to perceptions of harm is particularly important in China.

The current paper uses a population-level survey of smokers from the International Tobacco Control (ITC) China Survey to test whether smokers who believe that their cigarette brand is smoother were significantly more likely to believe that their cigarette brand is less harmful. We also examined the extent to which smokers' sensory beliefs might mediate the relation between smoking 'light/low tar' cigarettes and the belief that their cigarettes are less harmful. We hypothesised that 'light/low tar' cigarette smokers would be more likely to say that their brand of cigarettes is less harmful to the extent that they believed that their brand of cigarettes is smoother.

METHODS

Participants

Respondents are from wave 3 of the ITC China Survey conducted from May to October 2009 in seven cities: Beijing, Guangzhou, Shenyang, Yinchuan, Shanghai, Changsha and Kunming. The paper is restricted to data from the wave 3 survey because the question asking smokers whether they smoked a cigarette that was described as 'light' or 'low tar' was added in wave 3. Respondents at wave 3 were either initially recruited in wave 1 or wave 2 (n=3549) or were recruited for the first time during wave 3 as part of the replenishment sample (n=1660). Kunming was added to the ITC China Project at wave 3. Only smokers were included in the analyses for this paper. The total sample size for this study was 5209.

Procedures

The ITC China Survey uses a stratified multistage cluster sampling design where each city is a stratum. Within each city, Jie Dao (street districts) were randomly selected and within each of the Jie Dao, residential blocks (Ju Wei Hui) were randomly selected. The probability of selection was proportional to the population size of the Jie Dao/Ju Wei Hui. Within the selected Ju Wei Hui, a complete list of household addresses was compiled and then a random sample of houses was drawn from the list using simple random sampling without replacement. Respondents within households were selected using the next birthday method where there was more than one person in a sampling category (smoker, non-smoker, etc).[27]

The smoker survey was a 40 min face-to-face survey conducted in Chinese by experienced survey interviewers specially trained to conduct the ITC China Survey. Respondents were given a small gift worth approximately ¥20 in appreciation for their participation. This compensation is typical for survey participation in China.

Research ethics approval was obtained from: the University of Waterloo, Canada, Roswell Park Cancer Institute, USA, the Cancer Council Victoria, Australia, and the Chinese National Center for Disease Control and Prevention, China. Further details about the ITC China Survey protocol and specific details about the wave 3 sampling, protocols and weight construction can be found online.[2728]

Measures

Dependent variable: belief about respondents' own brand of cigarettes— Respondents were asked: "Do you think that the brand you usually smoke might be a little less harmful, no different, or a little more harmful, compared to other cigarette brands?" Responses were: 1="A little less harmful," 2="No different," 3="A little more harmful." This variable was recoded so that 1="A little less harmful" and 0="A little more harmful/No different/don't know." Refused (n=25) responses were excluded.

Key Predictors

Sensory beliefs about own brand—Respondents were asked whether "The brand of cigarettes I usually smoke is smoother on my respiratory (throat and chest) system than other cigarette brands." Response options were on a five-point Likert scale from 1="Strongly disagree" to 5="Strongly agree." For the purpose of this analysis, sensory beliefs were coded as follows: 1="Strongly agree/Agree" and 0="Strongly disagree/ Disagree/Neither/Don't know."

Self-reported use of 'light' and 'low tar' cigarettes—Respondents reported whether they currently smoked a cigarette that was described as 'light', 'mild' or 'low tar' (response options were: 'Yes', 'No' or 'Don't know').

Potential covariates—Standard demographic measures included: sex, age (18–39, 40–54, 55+), ethnicity (Han vs 'other' ethnic groups), household income per month (categorised as: "Low<1000 Yuan per month," "Medium≥1000 Yuan to 2999 Yuan," "High≥3000 Yuan," "don't know/refused"), education (categorised as: "Low=No education or elementary school," "Medium=Junior high school or high school/technical high school," "High=College, university or higher") and city. Measures of cigarette consumption included: smoking 'every day' vs 'some days' and cigarettes smoked per day (0–10, 11–20, 21–30, 31+).

Knowledge of health effects of smoking—Respondents were asked whether smoking causes: stroke, lung cancer in smokers, emphysema, premature ageing, cardiovascular heart disease, oral cancer, impotence in male smokers, lung cancer in non-smokers from second-hand smoke; second-hand smoke causes chronic respiratory diseases in non-smokers; second-hand smoke causes heart attacks in non-smokers and secondhand smoke causes

pregnant women to miscarry and have underweight babies. Responses were coded so that "No/Don't know"=0 and "Yes"=1. The measure of health knowledge was the sum of all responses.

Health concerns about smoking—To assess health concerns, respondents were asked: "To what extent, if at all, has smoking damaged your health?" and "How worried are you, if at all, that smoking will damage your health in the future?" ("Not at all/Don't know," "A little" and "Very much"). Respondents were also asked: "In general, how would you describe your health?" 1="Poor" to 5= "Excellent." In addition, respondents were asked to what extent they considered themselves addicted to cigarettes ("Not at all," "A little," "Somewhat" and "A lot"). "Don't know" or missing responses were excluded (n=12).

Statistical analyses—SAS (V.9.3) was used for all statistical analyses except the mediation which used M-PLUS (V.6.11). Unweighted and weighted (using PROC SURVEYFREQ) frequencies were calculated for key variables. Weights were based on the number of people in the city population and the sampling category (household, residential block and street district). $\chi 2$ analyses were used to determine whether there were significant differences in the proportion of respondents who thought that their cigarettes were: (A) smoother and (B) less harmful by type of cigarette smoked ('light/low tar', 'regular' or 'don't know'). A weighted logistic regression equation using PROC SURVEYLOGISTIC was used to determine whether the belief that your cigarette brand is smoother was significantly associated with the belief that your cigarette brand is less harmful after adjusting for all covariates including current use of 'light/low tar' cigarettes. The covariates reported in the results were entered in step 1 and the belief that your brand is smoother was entered in step 2. Models were adjusted for strata and cluster (Jie Dao, Ju Wei Hui). The mediation analysis was conducted using M-Plus based on the protocol defined by Hayes[29] to test whether the belief that your brand is smoother mediates the relation between being a 'light/low tar' cigarette smoker (vs regular/don't know) and the belief that your brand is less harmful. Bootstrapped bias corrected 95% CIs of the direct and indirect effect were computed with 5000 bootstrapped samples (no adjustments were made for additional covariates in this simple test of the mediation).[29]

RESULTS

Online supplementary table S1 presents the unweighted and weighted (respectively) sample characteristics for respondents from the ITC China wave 3 Survey. Overall, the majority of smokers in our sample (74.5% weighted) reported that they currently smoked cigarettes described as 'light', 'mild' or 'low tar'.

Smokers' beliefs about their usual brand of cigarettes

Table 1 presents smokers'overall beliefs about their own brand of cigarettes at wave 3 stratified by the type of cigarettes smoked. The majority of smokers 'agreed' or 'strongly agreed' that their brand was smoother on the respiratory system (throat and chest) than other brands (52.8%). A greater proportion of 'light/low tar' smokers 'agreed' or 'strongly agreed' that their brand of cigarettes was smoother (58.3%) compared to 'regular' cigarette smokers

(35.3%) and respondents who did not know whether their cigarettes were ‘light/low tar’ (41.4%). Both differences were statistically significant (p<0.001). A minority of smokers in our sample said that their brand was a little less harmful than other brands of cigarettes (28.3%). ‘Light/low tar’ cigarette smokers were significantly more likely to say that their brand was a little less harmful than other brands (32.6%) than were ‘regular’ cigarette smokers (16.1%) and smokers who did not know whether their cigarettes were ‘light/low tar’ (13.6%; both comparisons p<0.001).

Factors associated with the belief that “my own brand of cigarettes is less harmful”

Table 2 presents the results of a weighted logistic regression to determine which factors at wave 3 were associated with the belief that “my own brand of cigarettes is a little less harmful.” Respondents who were older were significantly more likely to say that their brand of cigarettes was less harmful than other brands (40–54 vs 18–39: p<0.001, OR=1.79, 95% CI 1.41 to 2.28; 55+ vs 18–39: p<0.001, OR=2.11, 95% CI 1.71 to 2.61). Respondents who were worried that smoking would damage their health in the future were more likely to believe that their cigarettes were less harmful (‘a little’ vs ‘not at all/don’t know’: p=0.002, OR=1.37, 95% CI 1.12 to 1.67). Current ‘light/low tar’ cigarette smokers were significantly more likely to say that their brand of cigarettes was less harmful than other brands (p<0.001, OR=2.42, 95% CI 1.93 to 3.04). Smokers who agreed that their brand of cigarettes was smoother were significantly more likely to say that their brand of cigarettes was less harmful (p<0.001, OR=6.86, 95% CI 5.64 to 8.33).

Testing whether perceptions of smoothness is a mediator of the relation between ‘light/low tar’ smoking and perceptions of harmfulness

Figure 1 reports the results of the mediation analysis. The estimate for the indirect effect of ‘light/low tar’ cigarette smokers on the belief that their cigarettes are less harmful via their belief that their cigarettes are smoother was significant (b=0.32, bootstrapped bias-corrected 95% CI 0.28 to 0.37, p<0.001). ‘Light/low tar’ cigarette smokers are more likely to believe that their cigarettes are less harmful to the extent that they believe their cigarettes are smoother. The direct effect was also significant (b=0.24, bootstrapped bias-corrected 95% CI 0.13 to 0.34, p<0.001), which indicated that the mediation was partial and other factors may also mediate this association. Overall, the mediational model accounted for 39.7% of the variance in beliefs about the harmfulness of one’s own brand.

DISCUSSION

This study of a probability sample of smokers across seven cities in China found that smokers who perceive that their cigarettes are smoother than other brands are more likely to say that their brands are less harmful. The magnitude of this association is remarkable (OR=6.86) and demonstrates how important sensory beliefs are to smokers’ belief that their brand is less harmful. Consistent with previous research, ‘light/low tar’ cigarette smokers were more likely to say that their brand of cigarettes was less harmful.[13] Few other factors (age, health concern) predicted this belief. ‘Light/low tar’ cigarette smokers were also more likely to say that their brand of cigarette was smoother compared to that of ‘regular’ cigarette smokers. There was evidence of a mediation effect wherein ‘light/low tar’ cigarette

smokers were more likely to say that their cigarettes were less harmful to the extent that they believed that their brand of cigarettes was smoother. The mediation was only partial, suggesting that smoothness is only one of the factors that influences 'light/low tar' cigarette smokers' perceptions that their cigarettes may be less harmful.

The data for this study were collected several years after a voluntary removal of 'light' and 'low tar' descriptors in China in accordance with Article 11 of the WHO FCTC. However, the majority of respondents in our survey indicated that they smoked a 'light' or 'low tar' cigarette. Given that smokers, particularly those who reported smoking 'light/low tar' cigarettes, are more likely to believe that their brand is less harmful, this suggests that consistent with research in other jurisdictions the removal of 'light' descriptors is not sufficient to eliminate misperceptions.[1011] Moreover, the State Tobacco Monopoly Administration (STMA) in China further perpetuated the belief that 'low tar' cigarettes are less harmful through their 'low tar less harm' campaign,[23] and these results suggest that this strategy was effective. Tobacco control policies and programmes to remove misperceptions about the relative harms of cigarettes in China, including eliminating the low tar less harm campaign, are therefore urgently needed.

The majority of smokers in our sample believed that their brand of cigarettes was smoother than other brands (52.8%). We would anticipate that 'light/low tar' cigarette smokers would believe that their cigarettes were smoother.[3] However, a high proportion of respondents who did not know whether their cigarette brand was 'light/low tar' or who smoked a 'regular' cigarette also said that their brand of cigarettes was smoother. As previously mentioned, the belief that 'your brand is smoother than other brands' derives from many factors beyond 'light/low tar' descriptors. Smokers in China may also feel that their brands are smoother because overall cigarettes in China are likely to have become smoother with the increase in filter ventilation over time.[30] This finding therefore highlights the importance of examining beliefs about smokers' own brand of cigarettes rather than their beliefs about 'light/low tar' cigarettes, especially in those countries where such explicit descriptors have been eliminated.

The market share of 'low tar' cigarettes is on the rise in China, possibly because awareness of the health risks of smoking is on the rise and the government has been promoting the use of 'low tar' cigarettes as a harm reduction strategy.[2325] Smokers may be choosing 'light/low tar' cigarettes as a way to reduce their health risks. The rate of respondents indicating that they smoked a 'light/low tar' cigarette was also high, but this may reflect the fact that the definition of 'low tar' cigarettes has changed over time, and relatively speaking, most Chinese cigarettes are lower in tar compared with what they were previously.[30]

Recent tobacco control policies addressing the issue of 'light/low tar' cigarettes have focused on banning 'light' and 'low tar' descriptors in countries such as China. However, these regulations do not specifically address the association between smokers' sensory beliefs and risk perceptions. More recently, the Australian government has implemented plain packaging regulations specifying the removal of colours, brand imagery, trademarks and logos. Research has demonstrated that plain packaging reduces perceived cigarette smoothness.[31] Implementation of plain packaging is therefore a good first step in reducing

sensory beliefs and risk perceptions. However, this research suggests that the introduction of plain packaging alone may not be sufficient. ‘Light/low tar’ cigarettes are designed to taste smoother. Therefore, to truly eliminate the association between the sensory characteristics of ‘light/low tar’ cigarettes and the perception that these cigarettes are less harmful, there would also need to be regulations on the cigarette design. Articles 9 and 10 of the FCTC pertain to tobacco product regulation. These articles could be used to regulate any aspects of the cigarette design that create the perception that a particular cigarette is smoother and therefore less harmful.

Limitations

We relied on smokers’ self-reports to determine whether they smoked a ‘light/low tar’ cigarette. Respondents could have incorrectly identified themselves as a ‘light/low tar’ cigarette smoker. We do not directly assess the engineering and other cigarette package design features which affect smokers’ sensory experience and perceptions of risks of their own brands. Had we been able to use information about the engineering of the cigarette and package design, we could have also tested whether smoothness mediated the relation between these factors and perceptions of relative harm. Future research should incorporate these factors rather than relying solely on respondents’ self-reported use of ‘light’ cigarettes.

Sensory perceptions may also be related to other factors that were not considered in depth in this paper such as personal smoking style, smoking history and severity of dependence. Additional research studies should examine whether these factors are related to perceptions of smooth and relative harm.

The paper presents findings from a representative sample of smokers in seven cities in China. However, given that experimental studies in other jurisdictions have demonstrated a strong connection between sensory beliefs and perceptions of harm, we would anticipate that the findings should generalise elsewhere. Research in other jurisdictions should be conducted to replicate these findings.

CONCLUSION

Smokers’ beliefs about the harmfulness of their cigarettes are highly associated with their sensory beliefs. ‘Light/low tar’ cigarette smokers are more likely to say that their cigarettes are less harmful to the extent that they believe that their cigarettes are smoother. These findings demonstrate the importance of implementing tobacco control policies that address the impact that cigarette design and marketing can have in capitalising on a smoker’s natural associations between smoother sensations and lowered perceptions of harm.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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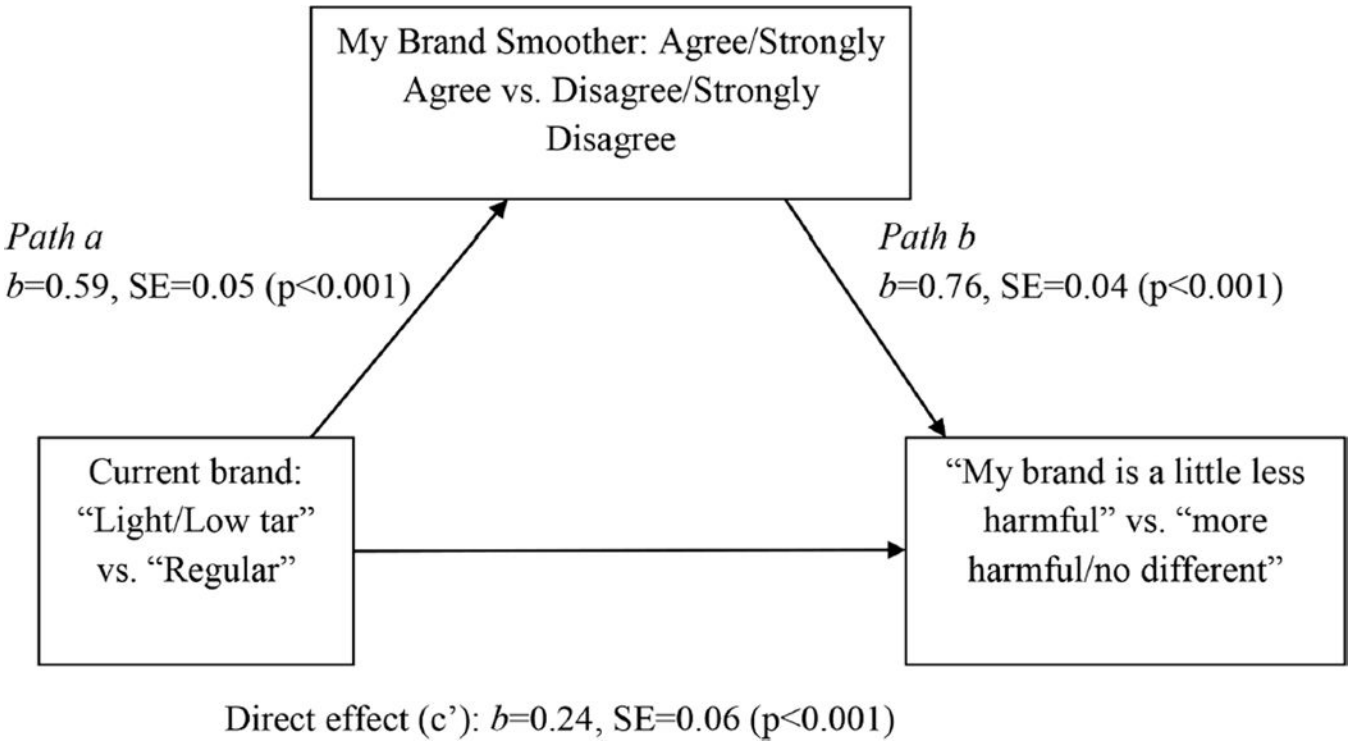

Figure 1.
Reports the results of the mediation analysis.

Table 1

Smokers' beliefs about their usual cigarette brand: International Tobacco Control (ITC) China (Wave 3 weighted percentages)

Factor	Overall (N=5166) (%)	'Light/low tar' cigarette smokers (n=3829) (%)	'Regular' cigarette smokers (n=1050) (%)	'Don't know brand type' cigarette smokers (n=287) (%)
My brand is smoother	$\chi 2$ (df=10)=256.86, p<0.001			
Strongly disagree	2.6	2.3	4.1	1.5
Disagree	23.8	21.1	34.6	21.9
Neutral	15.7	13.9	21.1	20.3
Agree	50.5	55.7	33.4	40.9
Strongly agree	2.3	2.6	1.9	0.5
Don't know	5.1	4.5	4.8	15.0
My brand	$\chi 2$ (df=6)=284.64, p<0.001			
No different	60.4	58.8	66.9	59.5
A little less harmful	28.3	32.6	16.1	13.6
A little more harmful	4.0	3.0	8.0	3.6
Don't know	7.3	5.6	9.0	23.3

Table 2

Logistic regression of the belief that “my usual brand is less harmful”: International Tobacco Control (ITC) China wave 3

Factor	n	My brand less harmful (%)*†	Adjusted OR (95% CI)	p Value
Demographic variables				
Gender				
Male	1419	28.1	1.00 (reference)	
Female	87	31.8	1.08 (0.83 to 1.41)	0.57
Age (years)				
18–39	232	18.8	1.00 (reference)	
40–54	697	29.2	1.79 (1.41 to 2.28)	<0.001
55+	577	32.9	2.11 (1.71 to 2.61)	<0.001
Ethnicity				
Han	1418	28.5	1.00 (reference)	
Other	86	25.6	1.07 (0.82 to 1.39)	0.64
Income				
Low	132	26.3	0.87 (0.65 to 1.18)	0.38
Medium	573	27.3	0.91 (0.74 to 1.12)	0.38
High	714	29.4	1.00 (reference)	
Don’t Know/Refused	84	28.1	1.12 (0.77 to 1.62)	0.56
Education				
Low	173	30.4	1.01 (0.74 to 1.37)	0.95
Medium	965	27.9	0.89 (0.73 to 1.07)	0.22
High	365	28	1.00 (reference)	
Smoking behaviour				
Every day	1418	28.1	0.96 (0.64 to 1.43)	0.83
Some days	88	31.6	1.00 (reference)	
Cigarettes per day				
0–10	630	30.6	1.00 (reference)	
11–20	663	26.7	0.88 (0.72 to 1.06)	0.18
21–30	127	27.3	0.92 (0.63 to 1.35)	0.67
31+	86	28.3	0.95 (0.63 to 1.43)	0.8
Health knowledge				
0	151	26.5	1.01 (0.98 to 1.03)‡	0.71
1	55	29.8		
2	80	26.3		
3	78	24		
4	116	30.4		
5	126	28.8		
6	138	25.8		
7	148	29.3		
8	150	30.2		

Factor	n	My brand less harmful (%)*†	Adjusted OR (95% CI)	p Value
9	119	25		
10	156	30.6		
11	188	30.2		
Current brand				
'Regular'	168	16.1	1.00 (reference)	
'Light/low tar'	1291	32.7	2.42 (1.93 to 3.04)	<0.001
Don't know	44	13.6	0.82 (0.54 to 1.24)	0.34
Health Concern				
Worried smoking has damaged health				
Very much	204	26.4	0.87 (0.63 to 1.17)	0.34
A little	795	28.9	0.92 (0.75 to 1.13)	0.43
Not at all/don't know	498	28	1.00 (reference) Worried smoking will damage health	
Very much	305	27.7	1.29 (0.94 to 1.77)	0.11
A little	765	30.3	1.37 (1.12 to 1.67)	0.002
Not at all/don't know	430	25.3	1.00 (reference) Describe your health	
1 Poor	38	31.6	1.00 (reference)	
2	76	27.3	0.80 (0.44 to 1.45)	0.46
3	689	27.4	0.78 (0.49 to 1.24)	0.3
4	481	28.5	0.82 (0.50 to 1.35)	0.43
5 Excellent	213	30.3	0.90 (0.55 to 1.47)	0.67
Perceived Addiction				
Not at all	180	32.8	1.00 (reference)	
A little	806	28.5	0.84 (0.63 to 1.12)	0.24
Somewhat	389	27.7	0.86 (0.64 to 1.14)	0.28
A lot	129	24	0.70 (0.45 to 1.08)	0.1
My brand smoother				
Agree/strongly agree	1239	44.7	6.86 (5.64 to 8.33)	<0.001
Disagree/strongly Disagree/neither/don't know	264	10.1	1.00 (reference)	

Response options for my brand less harmful 'a little less' n=1473 and 'no different/a little more' n=3588.

*Controlling for city.

†The belief prevalences presented for each response category of each factor are not adjusted for the other predictor variables in the model. These prevalences and the reported sample sizes represent the respondents who endorsed the belief that their brand is less harmful in each category.

‡Continuous variable