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Worry about lung cancer is related to numeracy and risk perception of diseases associated with smoking

Destiny Diaz^A, Brian Fix, MA^A, Rosalie Caruso, MS^A, Maansi Bansal-Travers, MS, PhD^A, Richard J. O'Connor, PhD^A

^ADepartment of Health Behavior, Roswell Park Comprehensive Cancer Center, Buffalo, NY, USA

Abstract

Background—Numeracy is one's ability to use numbers in context and influence's decision making and perceptions of health risk. Worry about lung cancer¹ is an indicator of perceived risk² and is related to interest in cessation and cancer screening.

Purpose—The analysis sought to explore underlying relationships among worry about lung cancer, smoking-related disease risk perceptions, and numeracy in a web-based panel.

Methods—A Web-based survey, including a numeracy measure, was completed by 1,682 participants aged 18–65 recruited in 2014. Former and current smokers were asked about LC worry and current smokers were asked their PR of diseases associated with smoking.

Results—Females ($m=25.64$, 95% CI [24.67, 26.61]), respondents aged 45–65 ($m=26.15$, 95% CI [24.89, 27.41]), those who worry “all the time” about LC ($m=27.62$, 95% CI [25.66, 29.58]), and respondents perceiving a higher risk of LC compared to other smokers ($m=28.84$, 95% CI [27.66, 30.01]) expressed significantly higher PR means. Higher household income (OR=1.20, 95% CI [1.08, 1.34]), age (OR=0.86, 95% CI [0.77, 0.98]), and comparative LC risk (OR=2.52, 95% CI [2.01, 3.17]) were significantly associated with greater worry about LC. As PR increases by one unit, the probability of worrying increases by 4.6%. For numeracy scores, odds ratio showed that as scores increased by one unit, the probability of worrying decreased by 11.9%.

Discussion—In this study, we have shown that PR has a positive association with LC worry and that numeracy has a negative association with LC worry.

Translation to health education practice—This information can be used to target subpopulations with low PR and numeracy about their risks for lung cancer and to develop tailored messages to educate these people.

Keywords

Numeracy; Risk Perception; Lung Cancer; Tobacco

Background

Combustible tobacco products are associated with many health problems, including lung cancer (LC).³ Widespread public education campaigns have increased awareness among smokers of the association between smoking and LC; therefore, smokers and former smokers may be more likely to worry about their risk of developing LC as a result of tobacco use.⁴ It is important to study what factors contribute to whether or not a person who smokes tobacco worries about LC as these factors may serve as indicators of the extent to which one understands personal risk.⁵ Lack of concern could reflect misperceptions about the disease itself and/or the strength of the association between tobacco use and LC risk.⁶ This misinformation can lead to uninformed decisions about product initiation, utilization, cessation, and relapse. In contrast, fully understanding the risks associated with tobacco use could lead to decreased use or cessation.⁷

Numeracy is a term used to describe the ability to understand mathematical information and may affect a person's decision-making skills.⁸ Health-relevant information is often presented using quantitative information, such as statistics. Numeracy affects how a person understands this information, and has been shown to influence judgment and decisions.⁹ Numeracy greatly impacts the effectiveness of risk communication messages and therefore is important with regards to tobacco use, largely due to the fact that tobacco educational materials and messages often reference statistical terminology.⁸ An example of this is "In the United States, 1 of every 3 cancer deaths is linked to smoking".¹⁰ Persons with greater numeracy show greater comprehension of important health information.¹¹ By determining which populations struggle with numeracy, tactics can be developed to communicate risk to specific populations in the most efficient way. The understanding of risks involved with smoking for people with low numeracy might be enhanced by visual aids instead of numbers.¹²

Consumer perceptions of a product are important, especially when the customer is deciding whether or not to use that product. Perception can be influenced by advertisements, health warnings, and previously-acquired knowledge related to a product.¹³ With regard to tobacco products, consumer perception can be influenced by judgments about the potential harm of a product.⁷ Therefore, it is important that people, who have used, currently use, or plan to use tobacco, are aware of the possible health effects of tobacco use. Previous research has explored possible reasons why people may not associate health risk perceptions with tobacco behaviors, as well as the consistency of these measures in tobacco control research.⁷ Although to our knowledge there is no existing research discussing numeracy and LC worry, there are many studies on numeracy¹⁴, decision making⁸, and risk perception of diseases associated with smoking.^{7,15}

Purpose

This study attempts to explore interrelationships among the amount of time current and former smokers spend worrying about LC, how much current smokers perceive their risk of diseases associated with cigarette smoking, and numeracy.

Methods

Participants

A web-based survey was conducted in 2014 among 3,001 14–65 year old U.S. residents, recruited from existing Web panels (Global Market Insite; GMI); participants 18 and older provided informed consent while participants 14–17 provided assent with parental consent. Participants included smokers and non-smokers and GMI's 'specialty youth panel' complies with the *Children's Online Privacy Protection Rule* (16 C.F.R. Part 312). Study participants were compensated 60 GMI 'marketpoints' (20 marketpoints = \$1) for participation and the study protocol was approved by the [redacted] Institutional Review Board.

Our sample consisted of current and former smokers. Out of the total population, only 11.2% of current or former smokers were between 14–17 years old. Given that this paper focuses on LC worry, and the question in our data set that measures LC worry was only asked to current and former smokers, this subsample of youth were excluded from the analyses; therefore our final sample consisted of 1682 respondents aged 18–65.

Design and Procedure

Participants completed a set of questions on demographic characteristics, perceived health risks associated with tobacco use, worry about LC, and questions to assess numeracy. This study included participants from a wide age range (18–65 years) and current and former smokers to evaluate differences in perceptions of health risk between groups.

Smoking Status—Smoking status was determined based on responses to the following questions: "Have you ever smoked a cigarette, even a few puffs?" and "Do you now smoke cigarettes?" Responses were categorized into 'ever/former' smoker (person who has ever smoked a cigarette but does not smoke now) and 'daily/non-daily' smoker (person who currently smokes cigarettes every day or some days).

LC Worry—The question "How often do you worry about getting LC? Would you say:" was asked of both current and former smokers. The recoded dichotomized variable shows 1 represented as worry and 0 represented as no worry. Response options provided were "rarely or never; sometimes, often, or all of the time"; responses were recoded into a dichotomized variable, with 'rarely or never' recoded as 1 and all other responses recoded as 0.

LC Risk—This question asked participants to rate, on a 1–5 scale, their answer to the following question: "Compared to other smokers your age, what do you think your chances are of getting LC?" The answers were scaled from 1–5 where 1 represented "much less risk" and 5 represented "much more risk". In order to limit the number of groups, this variable was recoded into a 1–3 scale: 1 representing "less risk" (responses 1–2), 2 representing "same risk" (response 3), or 3 representing "higher risk" (responses 4–5).

Perceived Risk—Current daily/non-daily smokers were asked to independently compare their perceived risk² of conditions (LC, emphysema, mouth cancer, bronchitis, heart disease, stroke, tooth loss, abscesses, and nicotine addiction) to non-tobacco users. The main question was "Please indicate what you believe your risk is for developing the following

health problems, compared to a person who does NOT use tobacco. Would you say that you are” All risk perceptions were rated on a scale of 1–5, 1 being much less likely and 5 being much more likely. The perceived risk scale was modified and obtained from a prior study examining the relationship between perceived health risks and responses to use of snus and medical nicotine²⁰. This scale asked participants to rate disease risk (LC, emphysema, heart disease, stroke, addiction, and other cancers) on a 1–10 visual analogue scale²⁰. Tests show that there was significant convergent validity between the responses to the end of treatment product questionnaire and the PHR scales²⁰. A Cronbach’s alpha of $\alpha=.954$ and a mean inter item correlation of $r=.3715$ were observed, suggesting high internal consistency. The alpha values did not increase when any of the items were deleted. The nine PR items were summed to create a summary measure describing a person’s overall risk perception (scale range: 9–45); this measure was rescaled to range from 0–36 to provide a zero point.

Numeracy.—For numeracy, eight questions involving mathematical and statistical problems were included to access a participant’s numeracy ability.¹⁴ The questionnaire¹⁴ used in this study (see Table 1) was derived from pre-existing measures: Schwartz et al. (1997)¹⁶ three-item measure, the Lipkus et al. (2001)¹⁷ expanded 11-item numeracy scale, further expansion of that scale by Peters, Hibbard et al. (2007)¹⁸, and Frederick’s (2005) CRT¹⁹. Reliability was assessed using two independent Rasch analyses;¹⁴ the Cronbach’s alphas were $\alpha=.71$, suggesting an acceptable level of internal consistency, while person reliability was .65 and the mean inter-item correlation was $r=.24$, demonstrating a small positive correlation and adequate fit statistics.¹⁴ Regarding convergent validity, the numeracy measure was significantly correlated with individuals’ subjective perceptions of numeracy ($r = .55$, $p<.001$), and showed a correlation with the ratio bias task ($r=.16$) comparable to other numeracy measures ($r=.11$ for CRT and $r=.14$ for Lipkus et al. scale). Results showed stronger predictive validity in these judgments and decisions, compared with the other two measures.¹⁴ Reliability analysis on the current dataset shows a Cronbach’s alpha of $\alpha=.743$ and mean inter-item correlation $r=.387$, similar to the original publication.¹⁴ Cronbach’s alpha did not increase when any of the items were deleted. Items were scored as 1 (correct) or 0 (incorrect) and then summed, such that a score of 0 indicated no correct answers and 8 indicated a perfect score.

Analyses

Data were analyzed using SPSS Statistics 21 (IBM, Armonk NY). Analysis of covariance, binary logistic regression, T-tests, and chi-squared tests were used.

Results

Our sample consisted of 46% males and 54% females, with 16% 18–25 years of age, 23.8% 26–34 year olds, and 60% 35–65 year olds. Of these participants, 17% were former smokers and 83% were current (daily/non-daily) smokers 42% reported smoking 10 or fewer cigarettes per day, 41% reported 11–20, 13% reported 21–30, and 3% reported smoking over 30 cigarettes per day. In our population, 3% did not complete high school, 19% were high school graduates or equivalent, 28% had some college/technical school, and 51% had a college degree. White/Caucasian was the most commonly identified racial group (75%)

while 12% identified as Hispanic, 7% as Black/ African American, 5% as Asian or Pacific Islander, and 1% as a member of another group.

Correlations

Bivariate correlation tests used in SPSS showed that comparative LC and numeracy share a negative relationship ($r_s = -.081$, $p = .001$). Also, comparative LC risk is positively associated with risk perception ($r_s = .333$, $p < .001$) and with LC worry ($r_s = .363$, $p < .001$). Numeracy has a positive relationship with risk perception ($r_s = .112$, $p < .001$) and a negative one with LC worry ($r_s = -.116$, $p < .001$). LC worry and risk perception are positively correlated ($r_s = .202$, $p < .001$).

LC worry

Of the 1682 current and former smokers over the age of 18 in the sample who answered these questions, 27.8% reported not worrying about LC; current smokers were more likely to report worrying about LC compared to those who no longer smoke. Worry did not appear to differ by sex, race/ethnicity, or education. The mean numeracy score of the total sample is 2.82 while the mean PR sum is 24.54. In people who do not report worry, the PR mean sum was 21.41 and the numeracy mean was 3.19, compared to 25.39 and 2.67 in participants with at least some worry. The only variables with significance in the differences of LC worry between groups ($p < .05$) are age, income, smoking status, cigarette consumption, LC risk compared to smokers of the same age, numeracy scores, and PR sum (see Table 3).

Numeracy

Table 1 summarized the percentage of respondents answering correctly by item. Numeracy summary scores differed by smoking status, gender, age, education, income, LC worry, race, consumption, and comparative LC risk ($p < 0.05$) (see Figure 1). The respective variances accounted for are 2.8%, 1%, 1.6%, 2.1%, .8%, 1.5%, 2.6%, 1.7%, and 1%.

Perceived Risk

Table 2 shows mean and standard deviations for perceived risk by item. Age, LC worry, gender, smoking status, consumption, numeracy scores and LC risk compared to smokers, showed significant differences in PR sum scores ($p < .05$). The respective variances accounted for are 3.0%, 4%, 0.6%, 0.8%, 0.8%, 2.3% and 11.2%. 35–65 year olds ($m = 25.79$, $SD = 7.68$), people who worry about LC had a higher PR mean ($m = 25.39$, $SD = 7.91$) as well as those who think they are at a “higher risk” for LC compared to smokers of the same age ($m = 27.94$, $SD = 7.40$).

ANCOVA Results

There are relationships between scores and PR sums when compared by age, gender, LC worry, and comparative LC risk ($p < .05$). ANCOVA tests were run using only these significant variables. Females ($m = 25.64$, 95% CI [24.66, 26.61]) and respondents aged 45–65 ($m = 26.15$, 95% CI [24.89, 27.41]) expressed higher PR. Higher PR was also observed among those who worry “all the time” about LC ($m = 27.62$, 95% CI [25.66, 29.58]) and respondents who believe they are at a higher risk of being diagnosed with LC compared to

other smokers ($m=28.84$, 95% CI [27.66, 30.01]). For age, there are differences in mean PR between the age group 26–34 age group and the 35–44/45–65 age groups. Pairwise comparisons for LC worry show a difference in PR between those who worry rarely or never and those who worry often/all of the time and those who worry sometimes and those who worry often/all of the time ($p<.05$).

Logistic regression models

Logistic regression was used to examine independent associations of sociodemographic, smoking behavior, risk perception, and numeracy on PR. Independent variables included: age, race, gender, education level, amount of cigarette consumption, income, numeracy scores, PR scores, and the chances a person thinks they have of getting LC compared to other smokers their age. The only independent variables found to be significant are LC risk compared to smokers their age, income level, numeracy scores, education, age, and PR. Logistic regression tests were run and Table 4 shows the results with all the variables accounted for. These tests were run again with just the significant variables (having $p<.05$) and Table 5 summarizes these relationships. In sum, a significant inverse relationship was seen between numeracy scores and worry ($p<.05$) – for each one unit increase in numeracy score, the probability of worrying decreases by 11%, controlling for other factors. Additionally, as PR increases by one unit, the probability of worrying increases by 4.6%. As perceived LC risk increases by one unit, the probability of worrying goes up 2.5 fold. Greater income was generally positively associated with worry (probability increasing by 20.0% as increasing in income level). As education level increases, the probability of worrying about lung cancer increases by 24.5% and as age increases, the probability of lung cancer worry decreases by 13.6%.

Discussion

Findings show that worry about LC varies across age, income, smoking status, comparative LC risk (LC risk compared to other smokers of the same age), and cigarette consumption. Ages 45–65, people with an income of \$25001–\$50000, current smokers, those who think they are at the same risk for LC, current smokers, and those people who smoke 11–20 cigarettes a day, are populations that have higher amounts of LC worry. Numeracy scores vary across levels of cigarette consumption, smoking status, gender, age, education, LC worry, income, and comparative LC risk. LC worry, age, and comparative LC risk differed in risk perception.

Income, comparative LC risk, numeracy scores, and PR sums, education, and age are significantly associated with odds of worry. For education, as education level increased by one unit, the probability of worrying also increased by 24.5%. As age increased by one unit, the probability of worrying decreased by 13.6%. Odds ratios indicate that as risk increases by one unit, the probability of worrying goes up 2.5 fold. Thus perceiving your risk as higher than a smoker of the same age may be associated with LC worry. For numeracy scores, odds ratio showed that as scores increased by one unit, the probability of worrying decreased by 11.9%. Therefore, low numeracy may be associated with more LC worry. For risk perception sums, as scores increased by one unit, the probability of worrying also

increased by 4.6%. Therefore a person's chance of worrying about LC increases as risk perception increases.

Of interest is the observation that numeracy and PR have independent relationships to worry. Data from HINTS, which includes a measure of perceived numeracy, shows a similar inverse relationship, with low numerate individuals reporting greater worry.¹⁵ These data showed that low numeracy was associated with increased fatalism and lower knowledge, which may serve as explanatory variables, but were unmeasured in the current study.

Implications and Limitations

The results of this research suggest that specific sociodemographic characteristics are associated with an increased likelihood of worrying about LC. This study found that income, comparative LC risk, numeracy scores, and PR sums, appear to be significant predictors of PR of LC. Determining which of these groups perceive their chances of being diagnosed with LC as less than their actual risk can be very important in crafting and potentially tailoring public health campaigns designed to inform users and potential users of these risks. If the adverse health effects of cigarettes and other tobacco products are not clearly understood by users, they are not able to make an informed decision on whether to initiate use or continue use of the product. Findings from this study can also be used to develop educational campaigns targeted to specific subpopulations regarding their risk of lung cancer and the benefits of smoking cessation and LC screening across all tobacco use groups.

Over 300 participants who should have responded did not respond to the LC worry question, which is a limitation of the study as these participants could not be included in the analyses. The same 369 participants did not answer the question asking them to compare their LC risk to others of the same age. Of these, 88.1% were former smokers, 76.4% were Caucasian, 59.9% had a college degree or more, 97.8% smoke or smoked 10 or fewer cigarettes a day, 59.3% were ages 35–65, and 54.7% of them made more than \$50,000 a year. This suggests that there is not a differential response between participants who did not respond to these questions and were excluded from the analyses and the participants who were included.

Our study did not measure and account for how long people have smoked and thus in future studies, this measurement can be analyzed to determine if it plays a role in a person's risk perception of diseases associated with smoking. Another aspect that can be looked at in a further investigation of this study is how long ago former smokers have quit. This data may affect their risk perception as well how much they worry about LC. Regarding reliability and validity, we did not conduct validity tests on the instrumentation used for PR and numeracy. We instead noted the validity results from the papers on which we based these two scales.

This research can help to assist the people who do not worry about LC to be more aware of their risks of LC and potentially other health risks associated with smoking. Future research should evaluate what factors cause differences in the degree of LC worry within these groups and how to design effective messaging and advertising to better make people aware of the health risks associated with smoking and some actions they can take, such as smoking cessation and LC screening.

Translation to Health Education Practice

From a health education perspective, the findings of this research can inform informational campaigns geared to smokers and non-smokers who might hold misperceptions about the risks for LC associated with smoking. It can also help to promote awareness among smokers who report little or no worry about their risk of developing LC. This information can be used to develop tailored campaign to educate current and former smokers about their risk of LC and what actions they can take, such as cessation or screenings. The results demonstrate what topics in mathematics and statistics are difficult for smokers and nonsmokers to apply and that are also used in tobacco advertising. This study can assist health educators to design, implement and evaluate smoking related communications and educational materials accounting for numeracy concepts.

Acknowledgments

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Figure 1.
Mean numeracy score of each subpopulation by sociodemographic factors.

Table 1.

Numeracy measure.

Item	% correct																
NS1 Imagine that we roll a fair, six-sided die 1,000 times. Out of the 1,000 rolls, how many times do you think the die would come up as an even number?	60.4																
NS2 In the BIG BUCKS LOTTERY, the chances of winning a \$10.00 prize are 1%. What is your best guess about how many people would win a \$10.00 prize if 1,000 people each buy a single ticket from BIG BUCKS?	52.8																
NS3 In the ACME PUBLISHING SWEEPSTAKES, the chance of winning a car is 1 in 1,000. What percent of tickets of ACME PUBLISHING SWEEPSTAKES win a car.	21.9																
NS4 If the chance of getting a disease is 10%, how many people would be expected to get the disease out of 1000?	66.5																
NS5 If the chance of getting a disease is 20 out of 100, this would be the same as having a _____% chance of getting the disease.	70.4																
NS6 Suppose your friend just had a mammogram. The doctor knows from previous studies that, of 100 women like her, 10 have tumors and 90 do not. Of the 10 who do have tumors, the mammogram correctly finds 9 with tumors and incorrectly says that 1 does not have a tumor. Of the 90 women without tumors the mammogram correctly finds 80 without tumors and incorrectly says that 10 have tumors. The table below summarizes this information. Imagine your friend tests positive (as if she had a tumor), what is the likelihood that she actually has a tumor?	5.1																
<table><tr><td></td><td>Tested Positive</td><td>Tested Negative</td><td>Totals</td></tr><tr><td>Actually has a tumor</td><td>9</td><td>1</td><td>10</td></tr><tr><td>Does not have a tumor</td><td>10</td><td>80</td><td>90</td></tr><tr><td>Totals</td><td>19</td><td>81</td><td>100</td></tr></table>			Tested Positive	Tested Negative	Totals	Actually has a tumor	9	1	10	Does not have a tumor	10	80	90	Totals	19	81	100
	Tested Positive	Tested Negative	Totals														
Actually has a tumor	9	1	10														
Does not have a tumor	10	80	90														
Totals	19	81	100														
_____ out of _____																	
NS7 A bat and a ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost?	12.3																
NS8 In a lake, there is a patch of lilypads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half the lake?	19.1																

Table 2.

Perceived Risk Measure

Disease	Mean Score	Standard Deviation
Lung Cancer	3.79	1.11
Emphysema	3.75	1.09
Mouth Cancer	3.65	1.103
Bronchitis	3.74	1.051
Heart Disease	3.72	1.062
Stroke	3.69	1.037
Tooth Loss	3.59	1.053
Abscesses	3.49	1.075
Nicotine Addiction	4.02	1.128

Table 3.

Demographic breakdown showing the percentage of people who worry, or do not worry, about lung cancer.

% Worry about Lung Cancer (Total N=1682)				
Variable	% No Worry LC n=467 (27.8)	% Worry LC n=1215 (72.2)	Chi-Square	P Value
AGE			23.892	0.000
18–25 (n=272)	13.9	17		
26–34 (n=400)	20.1	25.2		
35–44 (n=336)	16.5	21.3		
45–65 (n=674)	49.5	36.5		
SEX			0	0.999
Male (n=778)	46.3	46.3		
Female (n=904)	53.7	53.7		
RACE/ETHNICITY			9.006	0.109
Hispanic (n=206)	9.9	13.2		
White/Caucasian (n=1257)	77.9	73.5		
Black, African, or African American (n=114)	6.4	6.9		
Asian or Pacific Islander (n=82)	3.6	5.3		
American Indian or Alaskan Native (n=10)	0.9	0.5		
Other (n=13)	1.3	0.6		
INCOME			17.854	0.003
\$25000 or less (n=277)	21.4	14.6		
\$25001-\$50000 (n=419)	26.1	24.4		
\$50001-\$75000 (n=379)	21.4	23		
\$75001-\$100000 (n=298)	14.3	19		
\$100001 or more (n=286)	14.8	17.9		
Prefer not to answer (n=23)	1.9	1.2		
CIGARRETTE CONSUMPTION			30.446	0
10 or less (n=705)	51.8	38.1		
11 to 20 (n=694)	33.6	44.2		
21 to 30 (n=222)	10.1	14.4		
31 or more (n=61)	4.5	3.3		
SMOKING STATUS			166.366	0
Current (n=1367)	64	90.4		
Former (n=285)	36	9.6		
COMPARATIVE LC RISK			225.332	0
less risk (n=449)	50.1	17.7		
same risk (n=818)	43.7	50.5		
higher risk (n=415)	6.2	31.8		
EDUCATION			6.605	0.158

% Worry about Lung Cancer (Total N=1682)				
Variable	% No Worry LC n=467 (27.8)	% Worry LC n=1215 (72.2)	Chi-Square	P Value
Still in School (not college) (n=313)	0.2	0.1		
HS Graduate (n=471)	19.1	18.4		
Some college and/ or technical school (n=852)	31.5	26.7		
College Grad + (n=852)	47.5	51.9		
Did not graduate HS (n=44)	1.7	3		

Table 4.

Logistic regression results showing what factors were found to be significant when predicting whether or not someone worries about lung cancer.

Log regression results				
Variable	p value	Odds Ratio	Lower CI	Upper CI
AGE				
Global Test	0.033	0.875	0.774	0.989
18–25	0.015			
26–34	0.015	1.652	1.103	2.473
35–44	0.224	1.265	0.866	1.846
45–65	0.006	1.825	1.190	2.800
SEX				
Global Test	0.297	0.861	0.650	1.141
Male				
Female	0.451	1.118	0.837	1.494
RACE/ETHNICITY				
Global Test	0.580	0.950	0.792	1.139
Hispanic	0.399			
White/Caucasian	0.121	2.970	0.751	11.748
Black, African, or African American	0.094	3.123	0.824	11.840
Asian or Pacific Islander	0.188	2.591	0.628	10.697
American Indian or Alaskan Native	0.039	4.934	1.081	22.520
Other	0.507	1.940	0.273	13.770
INCOME				
Global Test	0.013	1.244	1.047	1.478
\$25000 or less	0.007			
\$25001-\$50000	0.610	1.326	0.448	3.922
\$50001-\$75000	0.270	1.840	0.623	5.433
\$75001-\$100000	0.079	2.679	0.893	8.037
\$100001 or more	0.057	2.974	0.967	9.144
Prefer not to answer	0.072	2.827	0.911	8.771
CIGARRETTE CONSUMPTION				
Global Test	0.174	0.882	0.736	1.057
10 or less	0.615			
11 to 20	0.216	1.640	0.749	3.590
21 to 30	0.332	1.466	0.677	3.173
31 or more	0.416	1.410	0.616	3.227
COMPARATIVE LC RISK				
Global Test	0.000	2.611	2.071	3.293
less risk	0.000			

Log regression results				
Variable	p value	Odds Ratio	Lower CI	Upper CI
same risk	0.000	0.129	0.078	0.216
higher risk	0.000	0.277	0.176	0.436
EDUCATION				
Global Test	0.013	1.244	1.047	1.478
Still in School (not college)	0.161			
HS Graduate	0.272	0.192	0.010	3.636
Some college and/ or technical school	0.094	0.444	0.172	1.147
College Grad +	0.051	0.391	0.152	1.002
Did not graduate HS	0.203	0.540	0.209	1.396
PR Sums Scaled (0–36) (no categorical variables)	0.000	1.046	1.028	1.065
With Categorical Variables	0.000	1.046	1.028	1.065
Numeracy Scores (no categorical variables)	0.001	0.881	0.817	0.951
With Categorical Variables	0.002	0.884	0.817	0.956

Table 5.

Logistic regression results showing only significant variables.

Log regression results with significant variables only and pairwise comparison results				
Variable	p value	Odds Ratio	Lower CI	Upper CI
AGE				
Global Test	0.018	0.864	0.766	0.975
18–25	0.010			
26–34	0.008	1.711	1.152	2.540
35–44	0.185	1.283	0.888	1.854
45–65	0.005	1.818	1.193	2.771
INCOME				
Global Test	0.001	1.200	1.078	1.335
\$25000 or less	0.004			
\$25001-\$50000	0.568	1.370	0.464	4.045
\$50001-\$75000	0.246	1.894	0.643	5.576
\$75001-\$100000	0.060	2.862	0.956	8.572
\$100001 or more	0.049	3.079	1.006	9.424
Prefer not to answer	0.057	2.989	0.967	9.239
EDUCATION				
Global Test	0.012	1.245	1.049	1.479
Still in School (not college)	0.107			
HS Graduate	0.293	0.208	0.011	3.879
Some college and/ or technical school	0.095	0.448	0.175	1.151
College Grad +	0.044	0.382	0.150	0.973
Did not graduate HS	0.218	0.553	0.215	1.420
COMPARATIVE LC RISK				
Global Test	0.000	2.524	2.011	3.167
less risk	0.000			
same risk	0.000	0.139	0.084	0.230
higher risk	0.000	0.289	0.184	0.453
PR Sums Scaled (0–36) (no categorical variables)	0.000	1.046	1.028	1.064
With Categorical Variables	0.000	1.046	1.028	1.064
Numeracy Scores (no categorical variables)	0.002	0.890	0.826	0.959
With Categorical Variables	0.006	0.899	0.833	0.971