Published in final edited form as:

J Dual Diagn. 2017 ; 13(1): 29–35. doi:10.1080/15504263.2016.1260190.

Predictors of the Perception of Smoking Health Risks in Smokers With or Without Schizophrenia

William J. Kowalczyk, PhD^a, Heidi J. Wehring, PharmD^b, George Burton, BS^a, Heather Raley, LCPC^b, Stephanie Feldman, MSW^b, Stephen J. Heishman, PhD^a, and Deanna L. Kelly, PharmD, BCPP^b

^aNational Institute on Drug Abuse, Intramural Research Program, Baltimore, Maryland, USA

^bMaryland Psychiatric Research Center, University of Maryland School of Medicine, Baltimore, Maryland, USA

Abstract

Objective—This study sought to examine the predictors of health risk perception in smokers with or without schizophrenia.

Methods—The health risk subscale from the Smoking Consequences Questionnaire was dichotomized and used to measure health risk perception in smokers with ($n = 67$) and without schizophrenia ($n = 100$). A backward stepwise logistic regression was conducted using variables associated at the bivariate level to determine multivariate predictors.

Results—Overall, 62.5% of smokers without schizophrenia and 40.3% of smokers with schizophrenia completely recognize the health risks of smoking ($p = .01$). Multivariate predictors for smokers without schizophrenia included: sex (Exp (B) = .3; $p < .05$), Smoking Consequences Questionnaire state enhancement (Exp (B) = .69; $p < .01$), and craving relief (Exp (B) = 1.8; $p < .01$). Among smokers with schizophrenia, predictors were education (Exp (B) = .7; $p < .05$), nicotine dependence (Exp (B) = .5; $p < .01$), motivation to quit (Exp (B) = 1.8; $p < .01$), and Smoking Consequences Questionnaire craving relief (Exp (B) = 1.8; $p < .01$).

Conclusions—There was overlap and differences between predictors in smokers with and without schizophrenia. Commonly used techniques for education on the health consequences of cigarettes may work in smokers with schizophrenia, but intervention efforts specifically tailored to smokers with schizophrenia might be more efficacious.

Keywords

Schizophrenia; cigarette smoking; health risks; perception

CONTACT: Heidi J. Wehring, hwehring@mprc.umaryland.edu, Maryland Psychiatric Research Center, University of Maryland School of Medicine, Box 21247, Baltimore, MD 21228, USA.

Disclosures

All authors report no financial relationships with commercial interests.

Introduction

Smoking is linked to significant morbidity and mortality; tobacco use has been causally linked to cardiac disease, cancer, lung disorders, and diabetes (Substance Abuse and Mental Health Services Administration, 2016; U.S. Department of Health and Human Services, 2014). People with schizophrenia are more likely to smoke; studies report 60% to 70% prevalence (Agaku, King, & Dube, 2014; de Leon et al., 1995; Dickerson et al., 2013). Tobacco-related conditions may be responsible for half of the deaths in persons with schizophrenia (Callaghan et al., 2014). Smokers with schizophrenia have a 2.5 times higher mortality risk compared to nonsmokers with schizophrenia and a 12-fold higher risk for cardiac-related mortality (Kelly et al., 2011).

Health risk knowledge is associated with motivation to quit and cessation in non-mentally ill smokers (Butler, Rayens, Zhang, & Hahn, 2011; Klein, Zajac, & Monin, 2009; White, Redner, Skelly, & Higgins, 2014). Risk perception distinguished persons who intended to stop smoking from those who did not (Williams, Herzog, & Simmons, 2011) and is a main reason for quitting in smokers with schizophrenia (Filia et al., 2014). Therefore, educating smokers about health risks may be valuable to motivate them to consider quitting.

The tobacco-related conditions that contribute to morbidity in smokers with schizophrenia have led to efforts toward better methods of education and motivation toward cessation. Persons with severe mental illness may be motivated to reduce or quit (Peckham et al., 2015); however, the reasons for smoking and underlying reinforcement of tobacco use may differ in this subset of smokers. This study is a secondary data analysis of research conducted to identify clinical and demographic variables associated with motivation to quit smoking among smokers with and without schizophrenia. In this paper, we examine the differences in health risk perception between smokers with and without schizophrenia, expecting that smokers with schizophrenia will have less awareness of the health risks. Then we conduct an exploratory analysis of the patterns of demographic, health, and smoking consequences that are predictors for smoking health risk perception as a step toward understanding how to intervene on health risk perception in smokers with schizophrenia.

Materials and methods

Participants

The study included smokers older than 18 years old, with or without schizophrenia or schizoaffective disorder (referred to throughout as “schizophrenia”) as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR) and verified by the Structured Clinical Interview for Diagnoses (First, Gibbon, Spitzer, & Williams, 2002). This interview was also used to rule out other Axis 1 disorders for both groups. Smokers with schizophrenia were recruited at the Maryland Psychiatric Research Center, University of Maryland-Baltimore School of Medicine, and smokers without schizophrenia were recruited at the National Institute on Drug Abuse (NIDA), Intramural Research Program, through popular media. All participants smoked 5 cigarettes daily, had a breath carbon monoxide level of 8 parts per million, and were not currently attempting to quit or reduce smoking. This study was approved by institutional review boards at NIDA, University of Maryland-

Baltimore, and the State of Maryland Department of Health and Mental Hygiene. Both inpatients and outpatients were recruited for larger study that was previously reported elsewhere (Kelly et al., 2010; Lo et al., 2011); however, only outpatients are included here. Inpatient participants were excluded because they often have a greater symptom severity and restrictions for tobacco use.

Procedure

The study consisted of a single visit. Participants signed consent, completed a semi-structured interview, and answered clinical and demographic information. Following screening procedures, including breath carbon monoxide, participants smoked a cigarette of their choice to standardize the time of last tobacco exposure before study assessments.

Measures

Participants completed the Smoking Consequences Questionnaire-Adult (Copeland, Brandon, & Quinn, 1995), Fagerstrom Test for Nicotine Dependence (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991), and the Stages of Change (DiClemente et al., 1991) within a battery of other questionnaires. The Smoking Consequences Questionnaire is a 55-item scale that presents short statements, rated on a scale of 0 to 9, indicating how likely participants believe a consequence is for them. The primary outcome of this paper is the perception of health risks domain of the Smoking Consequences Questionnaire. This variable was positively skewed and was transformed, categorizing participants as recognizing the health risks of smoking if the average score was ≥ 8.25 . The Smoking Consequences Questionnaire was included as predictors to examine how perception of other consequences relates to perception of health risk. The Fagerstrom Test for Nicotine Dependence is the standard measure for nicotine dependence. The Stages of Change is a means of assessing motivation to quit on a 7-point scale. These variables were included in analyses in order to examine the relationship between dependence severity and motivation to quit with health risk perception. Participants also answered questions regarding physical illness and general subjective view of their health. The health variables were included in analyses to determine whether a participants' health state or having a smoking-related illness was associated with health risk perception.

Analysis

Bivariate analyses were conducted to determine appropriate variables for the multivariate model. Backward stepwise logistic regression was then performed to identify the best predictors of perception of health risks of smoking that satisfied both parsimony and goodness of fit. Consistent with procedures outlined by Hosmer and Lemeshow (2004), variables with $p < .25$ in bivariate testing were entered into the multivariate logistic model. The Hosmer–Lemeshow goodness-of-fit test was used to assess model fit. Variables with $p < .1$ were removed individually to arrive at a parsimonious model.

Results

Population

Five smokers with schizophrenia and four smokers without schizophrenia were removed for missing values ($n = 67$ and $n = 96$, respectively).

Differences between smokers with and smokers without schizophrenia are presented in Table 1. Smokers with schizophrenia were older, were more likely to be White, were more likely to have a pulmonary disorder, and rated their health as worse than smokers without schizophrenia. Smokers with schizophrenia were less likely to completely recognize health risks of smoking. Smokers with schizophrenia also scored higher on the Smoking Consequences Questionnaire domains of stimulation/state enhancement and tastes good/feels good.

Smokers with schizophrenia

Bivariate and multivariate analyses are displayed in Table 2. In bivariate analyses, smokers with schizophrenia who completely recognize the health risks of smoking were less likely to have a pulmonary disorder, but view their general health as worse. Recognizing the health risks of smoking was associated with greater dependence on the Fagerstrom Test for Nicotine Dependence, more cigarettes smoked per day, greater motivation to quit, and greater scores in the Smoking Consequences Questionnaire domains of reduced negative affect, controls appetite, and craving relief/addiction promotion.

The multivariate model demonstrated adequate goodness of fit (Hosmer and Lemeshow $\chi^2_8 = 12.2$, $p = .14$) and accounted for 54.3% of the variance, $\chi^2_3 = 34.4$, $p = .001$. Smokers with schizophrenia who completely recognize the health risks of smoking scored higher on the Fagerstrom Test for Nicotine Dependence, motivation to quit, and the Smoking Consequences Questionnaire domain of craving relief/addiction promotion.

Smokers without schizophrenia

Bivariate and multivariate analyses are displayed in Table 2. In bivariate analyses, smokers without schizophrenia who recognize the health risks of smoking were less likely to be female. The multivariate model demonstrated adequate goodness of fit (Hosmer and Lemeshow $\chi^2_8 = 10.6$, $p = .23$) and accounted for 20.6% of the variance, $\chi^2_3 = 16.0$, $p = .001$. Smokers without schizophrenia who completely recognize the health risks of smoking were less likely to be female but also scored lower in the Smoking Consequences Questionnaire domain of stimulation/state enhancement and higher in the domain of craving relief/addiction promotion.

Discussion

As expected, smokers with schizophrenia were less likely to completely recognize the health risks of smoking than smokers without schizophrenia, despite having higher average daily cigarette use and significantly higher rates of existing pulmonary disease. Despite multifaceted educational efforts to convey the health risks of smoking through traditional and social media, 38% of smokers without schizophrenia and 60% of smokers with

schizophrenia still fail to completely recognize these serious risks. The results of this study highlight the need for more educational efforts on health risks associated with smoking, especially since people who understand the risks have higher cessation rates (Thakkar, Heeley, Chalmers, & Chow, 2015). Ongoing clinical trials on education, perception, and cessation may help determine optimal intervention timing and placement to maximize the relation between health risk and smoking cessation (NCT01685723; Li, Chan, Wang, & Lam, 2015). However, a recent paper examining clinician attitudes toward preventive education on health behaviors showed that one-third of clinicians believed that this reduced the time available for delivery of other services (Bartlem et al., 2016). Thus, mental health systems should provide opportunities for the education of smoking risks.

Smokers with schizophrenia who have the most realistic perceptions of smoking risk are those with high dependency scores and a high motivation to quit. The relationship between high dependency scores and understanding smoking risks in smokers with schizophrenia may reflect heavier smokers' realizations that significant smoking habits are unhealthy, where lighter smokers may be naïve to the risks of even "light" smoking. This may represent an opportunity for educational intervention. Some of the lack of understanding of risks might be due, in part, to less exposure to those risks in educational settings. Persons are most likely to present with thought disruptive symptoms of schizophrenia in the adolescent and/or young adult years, which may lead to disruption of education. Cognitive impairment and hallucinations/delusions may also make conversations regarding health risks of tobacco smoking more difficult. Therefore, not only could smokers with schizophrenia attain a lower level of reading comprehension, they may also miss out on school-based education on health risks of tobacco use, and their clinicians may not be as focused on cessation education compared to smokers without schizophrenia. Higher reading levels and educational attainment predicted quit attempts, possibly reflecting a better understanding of risks (White et al., 2014). Since materials targeting health risk education may be written beyond reading skills of many smokers with schizophrenia (Meade & Byrd, 1989) and educational limitations may have prevented exposure to classroom-based information, interventions for smokers with schizophrenia may need to be targeted differently than those for the general population.

We found that smokers in both groups who had higher craving relief/addiction promotion expectancies recognized the health risks. Being aware of the negative reinforcing effects of smoking (i.e., relief from craving) requires the acknowledgement of a detrimental effect of smoking (craving/addiction). Acknowledging one detrimental effect may help smokers recognize other detrimental aspects of smoking, leading to quit attempts. This idea is supported by behavioral data; greater cue-induced cravings are associated with a greater likelihood of a quit attempt (Conklin, Parzynski, Salkeld, Perkins, & Fonte, 2012). Awareness of one's personal susceptibility to cigarette cravings might be associated with other factors related to quit attempts. Having patients examine their cravings before a quit attempt might offer some clinical utility.

In smokers without schizophrenia who recognize health risks were more likely to be male, which replicates previous findings that gender is more important for health risk perception in smokers without than for smokers with schizophrenia (Filia et al., 2014). Smokers without

schizophrenia who smoke for state enhancement or stimulation were less likely to recognize cigarette health risks. This finding might represent the complement of what was found with craving relief in that craving relief is a form of negative reinforcement requiring a focus on detrimental aspects of smoking, whereas state enhancement is a form of positive reinforcement requiring a focus on beneficial aspects of smoking. This hypothesis could be examined experimentally by assessing perceptions of health risk in the context of smoking following forced abstinence (when negative reinforcement would be strongest) versus ad libitum smoking.

The present study is limited, as it was a secondary data analysis and not designed specifically to examine perceptions of health risks. Multiple predictors one might wish to include were not measured (e.g., family history of smoking-related deaths, optimism/pessimism), and the options for the independent variable were limited. For example, some measures of health risk perception assess both likelihood and desirability (Brandon & Baker, 1991). Another limitation was that our measure of perception of the health risks of smoking was not normally distributed. The point at which the scale was cut split the sample but also was at a value where the participants would have had to answer at least one of the health risk variables at the highest level. Given the pervasiveness of messages about the health risks of smoking, this cutpoint seems a natural place to split.

This study shows that perception of deleterious health effects of smoking is impaired in many smokers with schizophrenia, with only 40% of that group completely recognizing the likelihood of health risks. More work is needed on educational programs and tailored psychosocial treatments based on how well various clinical subgroups understand the health risks of smoking.

Acknowledgments

Results from this manuscript were presented at the International Congress on Schizophrenia Research, Grande Lakes, Florida, April 21–25, 2013.

Funding

Funding for this study was provided by the Intramural Research Program of the National Institutes of Health, National Institute on Drug Abuse (NIDA), and NIDA Residential Research Support Services Contract HHSN271200599091CADB (N01DA-5-9909 Kelly, PI). Both NIDA funds and personnel supported the design, study methods, and analysis of this study.

References

- Agaku IT, King BA, Dube SR. Current cigarette smoking among adults—United States, 2005–2012. *MMWR. Morbidity and Mortality Weekly Report*. 2014; 63(2):29–34. [PubMed: 24430098]
- Bartlem K, Bowman J, Ross K, Freund M, Wye P, McElwaine K, ... Wiggers J. Mental health clinician attitudes to the provision of preventive care for chronic disease risk behaviours and association with care provision. *BMC Psychiatry*. 2016; 16(1):1.doi: 10.1186/s12888-016-0763-3 [PubMed: 26739960]
- Brandon TH, Baker TB. The smoking consequences questionnaire: The subjective expected utility of smoking in college students. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*. 1991; 3(3):484.doi: 10.1037/1040-3590.3.3.484

- Butler KM, Rayens MK, Zhang M, Hahn EJ. Motivation to quit smoking among relatives of lung cancer patients. *Public Health Nursing*. 2011; 28(1):43–50. DOI: 10.1111/j.1525-1446.2010.00916.x [PubMed: 21198813]
- Callaghan RC, Veldhuizen S, Jeysingh T, Orlan C, Graham C, Kakouris G, ... Gatley J. Patterns of tobacco-related mortality among individuals diagnosed with schizophrenia, bipolar disorder, or depression. *Journal of Psychiatric Research*. 2014; 48(1):102–110. DOI: 10.1016/j.jpsychires.2013.09.014 [PubMed: 24139811]
- Conklin CA, Parzynski CS, Salkeld RP, Perkins KA, Fonte CA. Cue reactivity as a predictor of successful abstinence initiation among adult smokers. *Experimental and Clinical Psychopharmacology*. 2012; 20(6):473.doi: 10.1037/a0029599 [PubMed: 22889039]
- Copeland AL, Brandon TH, Quinn EP. The smoking consequences questionnaire-adult: Measurement of smoking outcome expectancies of experienced smokers. *Psychological Assessment*. 1995; 7(4):484.doi: 10.1037/1040-3590.7.4.484
- de Leon J, Dadvand M, Canuso C, White AO, Stanilla JK, Simpson GM. Schizophrenia and smoking: An epidemiological survey in a state hospital. *American Journal of Psychiatry*. 1995; 152(3):453–455. DOI: 10.1176/ajp.152.3.453 [PubMed: 7864277]
- Dickerson F, Stallings CR, Origoni AE, Vaughan C, Khushalani S, Schroeder J, Yolken RH. Cigarette smoking among persons with schizophrenia or bipolar disorder in routine clinical settings, 1999–2011. *Psychiatric Services*. 2013; 64(1):44–50. DOI: 10.1176/appi.ps.201200143 [PubMed: 23280457]
- DiClemente CC, Prochaska JO, Fairhurst SK, Velicer WF, Velasquez MM, Rossi JS. The process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*. 1991; 59(2):295.doi: 10.1037/0022-006X.59.2.295 [PubMed: 2030191]
- Filia SL, Baker AL, Gurchich CT, Richmond R, Lewin TJ, Kulkarni J. Gender differences in characteristics and outcomes of smokers diagnosed with psychosis participating in a smoking cessation intervention. *Psychiatry Research*. 2014; 215(3):586–593. DOI: 10.1016/j.psychres.2014.01.002
- First, MB., Gibbon, M., Spitzer, RL., Williams, JBW. User's guide for the structured clinical interview for DSM-IV-TR axis I disorders - research version - SCID-I for DSM-IV-TR, November 2002 revision. New York, NY: Biometrics Research Department, New York State Psychiatric Institute; 2002.
- Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom KO. The Fagerström Test for Nicotine Dependence: A revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addiction*. 1991; 86(9):1119–1127. DOI: 10.1111/j.1360-0443.1991.tb01879.x [PubMed: 1932883]
- Hosmer, DW., Jr, Lemeshow, S. *Applied logistic regression*. New York, NY: John Wiley & Sons; 2004.
- Kelly DL, McMahon RP, Wehring HJ, Liu F, Mackowick KM, Boggs DL, ... Dixon L. Cigarette smoking and mortality risk in people with schizophrenia. *Schizophrenia Bulletin*. 2011; 37:832–838. sbp152[pil]. DOI: 10.1093/schbul/sbp152 [PubMed: 20019128]
- Kelly DL, Raley HG, Lo S, Wright K, Liu F, McMahon RP, ... Wehring HJ. Perception of smoking risks and motivation to quit among nontreatment-seeking smokers with and without schizophrenia. *Schizophrenia Bulletin*. 2010; 38:543–551. DOI: 10.1093/schbul/sbq124 [PubMed: 21041835]
- Klein WM, Zajac LE, Monin MM. Worry as a moderator of the association between risk perceptions and quitting intentions in young adult and adult smokers. *Annals of Behavioral Medicine*. 2009; 38(3):256–261. DOI: 10.1007/s12160-009-9143-2 [PubMed: 20049660]
- Lehman, AF., Kernan, E., Postrado, L. *Toolkit for evaluating quality of life for persons with severe mental illness*. Baltimore, MD: Evaluation Center at Human Services Research Institute; 1995.
- Li WH, Chan SS, Wang KM, Lam T. Helping cancer patients quit smoking by increasing their risk perception: A study protocol of a cluster randomized controlled trial. *BMC Cancer*. 2015; 15(1):1.doi: 10.1186/s12885-015-1496-2 [PubMed: 25971837]
- Lo S, Heishman SJ, Raley H, Wright K, Wehring HJ, Moolchan ET, ... Richardson CM. Tobacco craving in smokers with and without schizophrenia. *Schizophrenia Research*. 2011; 127(1):241–245. DOI: 10.1016/j.schres.2010.06.017 [PubMed: 20637571]

- Meade CD, Byrd JC. Patient literacy and the readability of smoking education literature. *American Journal of Public Health*. 1989; 79(2):204–206. DOI: 10.2105/AJPH.79.2.204 [PubMed: 2913844]
- Peckham E, Man MS, Mitchell N, Li J, Becque T, Knowles S, ... Michie S. Smoking cessation intervention for severe mental ill health trial (SCIMITAR): A pilot randomised control trial of the clinical effectiveness and cost-effectiveness of a bespoke smoking cessation service. *Health Technology Assessment*. 2015; 19:1–148. DOI: 10.3310/hta19250
- Substance Abuse and Mental Health Services Administration. Substance abuse disorders. 2016. Retrieved from www.samhsa.gov/disorders/substance-use
- Thakkar J, Heeley EL, Chalmers J, Chow CK. Inaccurate risk perceptions contribute to treatment gaps in secondary prevention of cardiovascular disease. *Internal Medicine Journal*. 2015; 46:339–346. DOI: 10.1111/imj.12982
- U.S. Department of Health and Human Services. The health consequences of smoking—50 years of progress: A report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014. p. 17
- White TJ, Redner R, Skelly JM, Higgins ST. Examining educational attainment, prepregnancy smoking rate, and delay discounting as predictors of spontaneous quitting among pregnant smokers. *Experimental and Clinical Psychopharmacology*. 2014; 22(5):384.doi: 10.1037/a0037492 [PubMed: 25069014]
- Williams RJ, Herzog TA, Simmons VN. Risk perception and motivation to quit smoking: A partial test of the health action process approach. *Addictive Behaviors*. 2011; 36(7):789–791. DOI: 10.1016/j.addbeh.2011.03.003 [PubMed: 21463920]

Table 1

Descriptive data and differences between control and clinical participants.

		Smokers With Schizophrenia (<i>n</i> = 67)		Smokers Without Schizophrenia (<i>n</i> = 96)		
Category	Variable	<i>M</i>	%/ <i>SD</i>	<i>M</i> / <i>n</i>	%/ <i>SD</i>	<i>t/χ</i> ²
Demographics						
	Age (years)	45.63	10.58	36.99	10.75	−5.08**
	Education (years)	12.01	1.67	11.84	1.88	−0.60
	Gender (male) ^c	47	70.1	62	64.6	0.55
	Race (White) ^c	39	58.2	31	32.3	10.82**
Health-related factors						
	Pulmonary disorder (yes) ^c	16	23.9	2	2.1	19.09**
	Subjective view of general health	3.15	1.00	2.68	0.99	−2.92**
Smoking-related factors						
	Nicotine dependence	5.57	1.99	5.33	1.98	−0.74
	Cigarettes per day	21.42	11.93	17.15	7.90	−2.56*
	Motivation to quit	4.04	1.86	4.52	1.96	−0.68
Smoking Consequences Questionnaire						
	Accepts health risks ^c	27	40.3	60	62.5	7.816**
	Reduces negative affect	5.98	2.10	6.53	2.25	1.56
	Stimulates/state enhancement	4.97	2.13	3.64	2.24	−3.81**
	Taste good/feels good	5.34	2.06	4.85	2.16	−2.41*
	Facilitates social interaction	5.04	2.10	4.19	2.29	0.22
	Controls appetite	4.06	2.62	4.15	2.78	−0.53
	Craving relief/addiction promotion	6.17	1.94	6.71	1.47	1.91
	Causes negative physical feeling	2.93	2.38	2.36	2.18	−1.57
	Reduces boredom	6.34	1.88	6.14	2.30	−0.61
	Causes negative social impression	4.11	2.17	3.69	2.49	−1.12

Note.

* *p* .05;

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

10^c d^{##}

^c Categorical variable. Subjective view of general health was measured by the Quality of Life Index–Brief Version (Lehman, Kernan, & Postrado, 1995). Nicotine dependence is measured by the Fagerstrom Test of Nicotine Dependence. Motivation to change is measured using the Stages of Change.

Table 2

Predictors of cigarette use health risk perception in smokers with or without schizophrenia.

Smokers With Schizophrenia														Smokers Without Schizophrenia													
Category	Variable	Bivariate Associations						Multivariate Model						Bivariate Associations						Multivariate Model							
		Recognize Risk (<i>n</i> = 27)			Do Not Recognize Risk (<i>n</i> = 40)			Recognize Risk (<i>n</i> = 60)			Do Not Recognize Risk (<i>n</i> = 36)			Recognize Risk (<i>n</i> = 60)			Do Not Recognize Risk (<i>n</i> = 36)			Recognize Risk (<i>n</i> = 60)			Do Not Recognize Risk (<i>n</i> = 36)				
		<i>n</i> / <i>M</i>	%/ <i>SD</i>	<i>n</i> / <i>M</i>	%/ <i>SD</i>	<i>t</i> / χ^2	<i>OR</i> [†]	95%	CI	<i>n</i> / <i>M</i>	%/ <i>SD</i>	<i>n</i> / <i>M</i>	%/ <i>SD</i>	<i>t</i> / χ^2	<i>OR</i> [†]	95%	CI	<i>n</i> / <i>M</i>	%/ <i>SD</i>	<i>n</i> / <i>M</i>	%/ <i>SD</i>	<i>t</i> / χ^2	<i>OR</i> [†]	95%	CI		
<i>Demographics</i>																											
Gender	Male	28	73.5	19	66.7	0.001	—											43	71.7	19	52.8	3.51 [*]				1	
	Female	12	26.5	8	33.3													17	28.3	17	47.2				0.35 [*]	[0.14 0.91]	
<i>Health-related factors</i>																											
Pulmonary disorder	No disorder	34	85	17	63	4.31 [*]	‡											59	98.3	35	97.2	N/A				N/A	
	Disorder	6	15	10	37													1	1.7	1	2.8	N/A				N/A	
Subjective view of general health		2.69	3.52	0.98	2.9	2.58 [*]	‡											3.52	2.69	0.95	2.67	0.13				—	
<i>Smoking-related factors</i>																											
Nicotine dependence		5.28	6.74	1.61	4.78	4.50 ^{**}	1.99 ^{**}	[1.30 3.04]										6.74	5.28	2.05	5.42	−0.31				—	[1.30 3.04]
	Cigarettes per day	17.04	26.81	13.69	17.78	3.01 ^{**}	‡											26.81	17.04	7.54	17.33	−0.17				—	
Motivation to quit		4.45	4.85	1.56	3.5	3.10 ^{**}	1.92 ^{**}	[1.21 3.03]										4.85	4.45	2.05	4.64	−0.46				—	[1.21 3.03]
<i>Smoking Consequences Questionnaire</i>																											
Reduces negative affect		6.59	6.76	1.66	5.45	2.61 [*]	‡											6.76	6.59	2.46	6.42	0.36				—	
	Stimulates/state enhancement	3.38	5.21	2.07	4.82	0.74	—	[0.55 0.90]										5.21	3.38	2.4	4.08	−1.57				0.70 ^{**}	
Taste good/feels good		4.66	5.89	1.95	4.97	1.81	‡											5.89	4.66	2.28	5.16	−1.1				‡	
	Facilitates social interaction	3.98	5.4	1.86	4.81	1.14	—											5.40	3.98	2.4	4.54	−1.15				‡	
Controls appetite		4.04	4.93	2.68	3.47	2.31 [*]	‡											4.93	4.04	2.94	4.35	−0.53				—	

Category	Variable	Smokers With Schizophrenia										Smokers Without Schizophrenia				
		Bivariate Associations					Multivariate Model					Bivariate Associations				
		Recognize Risk (<i>n</i> = 27)					Do Not Recognize Risk (<i>n</i> = 40)					Recognize Risk (<i>n</i> = 60)				
		<i>n</i> / <i>M</i>	%/ <i>SD</i>	<i>n</i> / <i>M</i>	%/ <i>SD</i>	<i>t</i> / χ^2	<i>OR</i> [†]	95%	CI			<i>n</i> / <i>M</i>	%/ <i>SD</i>	<i>n</i> / <i>M</i>	%/ <i>SD</i>	<i>t</i> / χ^2
	Craving relief/addiction promotion	6.89	7.08	1.39	5.56	3.41 ^{**}	1.61 [*]	[1.06	2.45]			7.08	6.89	1.47	6.4	−.59
	Causes negative physical feeling	2.42	3.33	2.49	2.65	1.16	‡					3.33	2.42	2.31	2.26	0.35
	Reduces boredom	6.32	6.76	1.82	6.06	1.51	‡					6.76	6.32	2.35	5.84	0.98
	Causes negative social impression	3.68	4.68	2.28	3.72	1.8	‡					4.68	3.68	2.79	3.69	−0.02

Note.

* *p* .05;

** *p* .01.

[†] Adjusted for those variables in the final model.

[‡] Variables are excluded in the final model in backward stepwise selection procedure, adjusted *p* .20.—Variable not entered in the model, bivariate association *p* .25. Subjective view of general health was measured by the Quality of Life Index—Brief Version. Nicotine dependence is measured by the Fagerstrom Test of Nicotine Dependence. Motivation to change is measured using the Stages of Change.