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Intention to Try Tobacco among Middle School Students in a Predominantly Rural Environment of Central Appalachia

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Abstract

Background: Disparities in tobacco use exist across regions in the United States. The Central Appalachian region carries some of the very high rates of tobacco use prevalence but research on tobacco use initiation is sparse.

Objective: To investigate the intention to try tobacco and its associated factors among non-smoking youth.

Method: Data were obtained from school-based tobacco surveys (n=539) conducted in 11 middle schools (6th-8th grades; aged 10–15 years) in Northeast Tennessee in 2015–2016. Non-smoking participants without firm commitment to abstain from trying tobacco in the next year were considered to have an intention to try tobacco. The Full Information Maximum Likelihood

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Conflict of interest

Authors declare no conflict of interest.

estimation (FIML) method in Mplus was employed to conduct a multivariable logistic regression analysis to delineate correlates of intention to try tobacco.

Results: Overall, 20.0% of participants had intention to try tobacco. Among participants with intention to try tobacco, 53.7% owned tobacco-branded item(s), 86.1% believed that tobacco users have more friends, and 88.9% lived with tobacco users. In the adjusted logistic model, ever use of tobacco products, home smoking rules, owning tobacco-branded item(s), living with tobacco users, believing that tobacco users have more friends, and perception of easy access to tobacco products were significantly associated with intention to try tobacco ($p<0.02$).

Conclusion: This study suggests that individual, interpersonal and community level factors influence intention to try tobacco in this environment where tobacco preemption laws impede development of local tobacco control policies and regulations. Thus, efforts should focus on tobacco use initiation preventive programs, including school-based tobacco control programs.

Keywords

Intention; initiation; youth; smoking; tobacco; adolescent; Tennessee

INTRODUCTION

Tobacco smoking remains the leading preventable cause of morbidity and mortality in the United States (U.S.) (USDHHS, 2014). Over 36.5 million people in the U.S. continue to smoke (Jamal et al., 2016), and tobacco use accounts for over 480,000 annual deaths and about \$300 billion in economic costs (USDHHS, 2014). Tobacco control has become complicated due to the invention and popularity of new tobacco products, including hookah/waterpipe, little cigar and cigarillos (LCCs), and electronic cigarettes (e-cigarettes) (USDHHS, 2014). In particular, research reports show that e-cigarettes have become the most commonly used tobacco product among youth (Arrazola et al., 2015; Singh et al., 2016; USDHHS, 2014, 2016). As such, there are concerns that the uptake of these tobacco products may lead to conventional cigarette smoking, eroding public health gains in tobacco control (Cantrell, 2014; Dutra & Glantz, 2014; Grana, Benowitz, & Glantz, 2014; Leventhal et al., 2015). Approximately 90% of tobacco-dependent adults initiated tobacco use before they were 18 years old (USDHHS, 2012a), which makes the childhood and adolescent years critical for the prevention of smoking initiation and addiction.

Disparities in tobacco use exist in the U.S. (Pesko & Robarts, 2017; Roberts et al., 2016), with prevalence of tobacco smoking very high among people living in certain regions such as Central Appalachia (Mamudu, Littleton, & Wang, 2015). The high prevalence of tobacco use in rural areas may be explained by tobacco use risk factors such as low income, low educational attainment, limited/ineffective tobacco control policies and cultural norms (Byun, Meece, & Irvin, 2012; McMillen, Breen, & Cosby, 2004; Northridge et al., 2008; Wewers, Katz, Fickle, & Paskett, 2006). Addressing the rural-urban disparities in tobacco use will play a major role in reducing tobacco use in the U.S. and will contribute to achieving the *Healthy People 2020* (HP2020) goal of a national adult smoking rate of 12% by 2020 (CDC, 2015).

Northeast Tennessee, a predominantly rural part of Central Appalachia, has a high burden of tobacco use. Adult tobacco use prevalence in the eight counties of the region ranged from 23% to 40% in 2014, compared to the national prevalence of 18.1% at the time (Mamudu et al., 2015). This highlights the importance of identifying at-risk youth who have the intention to use tobacco products for targeted preventive efforts, since intention to use tobacco is known to predict future use of tobacco (Stanton, Barnett, & Silva, 2005; Wakefield et al., 2004). Previous studies in other populations have reported that factors associated with smoking initiation include peer and family pressure (Villanti, Boulay, & Juon, 2011), exposure to tobacco promotion and advertisements (Biener & Siegel, 2000; Henriksen, Schleicher, Feighery, & Fortmann, 2010; Lovato, Watts, & Stead, 2011), exposure to secondhand smoke (Voorhees et al., 2011; Wang, Ho, & Lam, 2011), lack of knowledge of the health risk associated with smoking (Gerking & Khaddaria, 2012; Song, Morrell, et al., 2009), and positive attitudes towards smoking (Cremers, Mercken, de Vries, & Oenema, 2015). However, the proportion and characteristics of children and adolescents intending to use or try tobacco in the future in the Northeast Tennessee region remains unknown.

Although Tennessee, the third largest tobacco growing state (Mamudu, Dadkar, Veeranki, & He, 2012), has shown some interests in preventing and controlling tobacco use by enacting some policies (Fallin & Glantz, 2015), it continues to lag behind other states in reducing tobacco use (American Lung Association, 2016; Fallin & Glantz, 2015; Robert Wood Johnson Foundation, 2016). The lack of literature on youth intention to use tobacco may impede policy development in the state because policy-makers are generally receptive to internally generated data (Cairney, Studlar, & Mamudu, 2012). Thus, to spur policy development and programs for preventing the initiation of tobacco use, this study aimed to estimate the prevalence of intention to try tobacco among non-smoking middle school students (6th-8th grades) in the region. In addition, the study sought to delineate factors associated with intention to try tobacco. This study will fill a major research gap and the results will also serve as the baseline for future studies on tobacco use intentions in this high-risk population.

The present study applies the constructs of the Ecological Model of Health (EMH) (Bronfenbrenner, 1977; McLeroy, Bibeau, Steckler, & Glanz, 1988) in studying tobacco use intentions. The EMH is based on the evidence that no single factor explains differences in health risk in the population. Ecological approaches to health promotion help redirect public health efforts to focus on factors beyond the individual (WHO, 2017). The model emphasizes that health behavior is influenced by individual and environmental factors, classified into the individual, the relationship, the community, and the societal factors (WHO, 2017). EMH was selected as the theoretical basis for this study because tobacco smoking and cessation have multi-level influences, including intrapersonal factors (genetics, risk perception, addiction), interpersonal (peer and parental smoking), community level factors (advertisement, socioeconomic status) and organization/policy level factors (smoke-free policies, taxation) (Rimer & Glanz, 2005). As such, we examined how intrapersonal and interpersonal factors, and the exposure to tobacco promotion affect intention to try tobacco among non-smoking youth.

METHODS

Participants

Data from a school-based tobacco use survey, Youth Tobacco Survey, conducted in 2015–2016 in two adjacent counties in the Northeast Tennessee region were analyzed. The Northeast Regional Health Office of the Tennessee Health Department conducted this school survey to collect data on the use of tobacco products among school-going children and adolescents. Informed consent was sought from their parents/guardians because all participants of the survey were under 16 years old. In addition, all participants were allowed to refuse participation or skip questions they did not want to answer. Thus, participation in the study was voluntary and parents/guardians were free to refuse or retract permission without any retribution if they did not consent to the participation of their children in the survey. To ensure confidentiality, the survey was made anonymous and the data contained no identifiers.

A convenience sample of 573 students from 11 middle schools was recruited for the study. For analysis, we excluded current tobacco users, defined as past 30-day use of tobacco products (29 students, representing 5.1%) and those who indicated they had ever used tobacco but declined to disclose their current use status (5 students, representing 0.9%). Thus, an analytic sample of 539 middle school students (6th to 8th grades) was used for this study.

This study was approved by the Institutional Review Board (IRB) of the corresponding authors' institution.

Measures

The survey questionnaire consisted of 27 items (Table 1), including 24 questions on tobacco use, perception, exposure to tobacco use by people living with the student, and three demographic questions. The survey adapted tobacco-related questions from the National Youth Tobacco Survey (NYTS) questionnaire (CDC, 2016). The questions on tobacco use assessed ever use of cigarettes, e-cigarettes, smokeless tobacco, little cigar or cigarillos and other tobacco products (dissolvable, hookah, among others); the number of days of tobacco use in the past 30 days (current usage); intention to try tobacco; and age of initiation of tobacco use.

Dependent Variable

The main outcome variable was intention to try any tobacco product (Table 1). This variable was assessed by the question: Do you think that you will try a tobacco product any time in the next year? [A=Definitely yes, B=Probably yes, C=Probably not, D=Definitely not]. Using a standard approach (Bunnell et al., 2015; Choi, Gilpin, Farkas, & Pierce, 2001; Pierce, Choi, Gilpin, Farkas, & Merritt, 1996), intention to try tobacco was defined as lack of a firm commitment to abstain from trying tobacco in the next year. All participants who responded 'Definitely yes', 'Probably yes', or 'Probably not' to the question were classified as having intention to try tobacco (coded as "1"), and all those who responded, 'Definitely

not' to the same question were classified as having no intention to try tobacco (coded as "0").

Independent Variables

Guided by the ecological model of health (McLeroy et al., 1988), and based on the existing literature (Bunnell et al., 2015; Fulmer et al., 2015; Gerking & Khaddaria, 2012; Hughes et al., 2015; Owusu et al., 2017), we included intrapersonal (age, sex, grade, perception of harm,), interpersonal (peer or family pressure, the belief that tobacco users have more friends, living with a tobacco user), and environmental (the exposure to tobacco promotion, home smoking rules) factors (Table 1). Prior tobacco use was assessed with the question, "which of the following tobacco products have you ever tried, even just one time?" [A=Cigarettes; B=Flavored cigarettes, such as Camel Crush or menthol; C=Chewing tobacco, snuff, or dip such as Redman or Skoal; D=Cigars or cigarillos (little cigars); E=Smoking tobacco from a hookah or waterpipe; F=Snus, such as Camel or Marlboro Snus; G=Dissolvable tobacco products, such as Ariva, Stonewall, Camel orbs, Camel sticks, or Camel strips; H=Clove cigars; I= Use electronic cigarettes; J= Some other new tobacco products not listed here; K=I have never tried any of the products listed above or any new tobacco product]. Participants were considered to have ever used tobacco products (coded as "1") if they responded "yes" to any of the questions. Participants who answered "no" to all the questions were deemed to have never used tobacco products (coded "0"). Ever use of tobacco products was included in the model to control for its influence on intention to try tobacco.

Statistical analysis

Frequencies and proportions were used to describe the study participants. Prevalence of intention to try tobacco was estimated for the overall analytic sample, and by the categories of the independent variables. A multivariable logistic regression model examined factors associated with intention to try tobacco. A model testing was performed to assess any deviations from the assumptions of logistic regression model before conducting the multivariable logistic regression analysis. The model diagnostics indicated a collinearity issue; age group and grade were highly correlated, warranting omission of one of them from the final model. The tolerance of the two variables was examined, finding that of age (0.29) to be greater than that of grade (0.27). Consequently, age was retained grade was excluded from the final model. To account for the approximately 11% of participants with missing data in the multivariable logistic regression analysis, the Full Information Maximum Likelihood estimation (FIML) (Enders, 2001) method in Mplus (Muthén & Muthén, 2010) was used to conduct a multivariable logistic regression analysis to examine factors associated with intention to try tobacco. The FIML accounts for missing data in the analysis by using all the available information to estimate the model, and it has been found to yield less bias than other methods of handling missing data in regression (Enders, 2001). The FIML, which assumes missing at random (Enders, 2001), was suitable because missingness was found to be at random. The significance level was set a priori at two-sided p-value of 0.05. Adjusted odds ratios (ORs) and associated 95% confidence intervals (CI) are reported. Data management and descriptive statistical analyses were performed using SAS version 9.4

(SAS Institute, Cary, NC, USA), and the multivariable logistic regression analysis was conducted in Mplus version 7.4 (Muthén & Muthén, 2010)

RESULTS

Participant characteristics

Table 2 shows the characteristics of the study participants. Of the 539 participants, more than half were females (51.8%). Age ranged from 10 to 15 years, with a mean age of 12.8 years and a standard deviation of 1 year. 26.3%, 29.1% and 44.3% of the students were in 6th, 7th and 8th grades, respectively. Among all participants, 11.4% had ever tried tobacco products. 28.2%, 14.0%, and 48.2% of the participants live in homes where smoking is allowed, own tobacco-branded items, and live with tobacco users, respectively. While about half (50.8%) of the students believe tobacco users have more friends, the overwhelming majority (91.2%) believe that tobacco products are harmful. About one-third of the participants (31.5%) believe that it is easy to access tobacco products. One-fifth of the participants (20.0%) have an intention to try tobacco in the next year.

Characteristics of participants with intention to try tobacco (n=108)

Among those with intention to try tobacco, two-thirds (75%) were 13–15 years old, 43.5% have ever tried tobacco, 53.7% own tobacco-branded items, 88.9% live with tobacco users, 89.8% believe that all tobacco products are dangerous, and 77.8% believe that they could easily access tobacco.

Factors associated with an intention to try tobacco (n=539)

Table 3 shows the results of the multivariable logistic regression analysis for the factors associated with intention to try tobacco among the study participants. Compared to participants who have never used tobacco, those who have ever tried tobacco had more than threefold increased odds of an intention to try tobacco in the next year (OR=4.66, 95% CI=1.82 – 11.9). The odds of intention to try tobacco among participants who reported owning tobacco-branded item(s) was more than eight times of the odds in those who have never owned such item(s) (OR=8.11, 95% CI=3.49 – 18.85). Living with a tobacco user was associated with significantly greater odds of an intention to try tobacco than not living with a tobacco user (OR=3.23, 95% CI=1.25 – 8.34). Participants who believe they have easy access to tobacco products showed increased odds of intention to try tobacco compared to those who indicated otherwise (OR=4.26, 95% CI=1.97 – 9.22). Home smoking rule, and believing that tobacco users have more friends, were significantly associated with an intention to try tobacco ($p<0.02$). However, sex, age, and knowledge of harm of tobacco use were not associated with an intention to try tobacco (Table 3).

DISCUSSION

Although the Central Appalachian region of Northeast Tennessee is disproportionately burdened with tobacco use and tobacco-induced diseases (Robert Wood Johnson Foundation, 2016), no study on youth's intentions to use tobacco products within the region exists. The present study examined intention to try tobacco among middle school students in

the region and found that more than one in five students intended to try tobacco in the next year. While about one in ten of those who have never tried tobacco intended to try it in the next year, about four in five youth who have ever tried any tobacco products intend to try it again. Additionally, more than half of the participants believe that tobacco users have more friends.

Being the first study of intention to try tobacco in the Northeast region of Tennessee, the results serve as a baseline for future studies in the population. National estimates show that more than one in five never smokers in middle and high schools have an intention to smoke tobacco in the next year (Bunnell et al., 2015), indicating that, despite the effort to control tobacco use, more youth are planning to begin smoking. The advent of novel tobacco products that are vigorously promoted and marketed (Duke et al., 2014; Fulmer et al., 2015; Henriksen et al., 2010), compounded by the addition of features that are more appealing to youth (Padon, Maloney, & Cappella, 2017) may partly account for the high rate of intention to try. Tobacco use behavior progresses from never-smoker through experimentation, regular smoking, and addiction (Mayhew, Flay, & Mott, 2000); therefore, unless effective interventions are implemented to prevent experimentation with tobacco, many susceptible non-smoking youth will likely begin using tobacco products leading to tobacco addiction. Indeed, our results indicate that those who try tobacco are likely to try it again. The high percentage of ever users who intend to try again in the next year should be a great source of concern due to the susceptibility of the developing brain to nicotine (Farber, Nelson, Groner, & Walley, 2015). Addiction is more likely to occur in these youth if no anti-tobacco intervention is implemented.

In contrast with literature (Gerking & Khaddaria, 2012; Song, Glantz, & Halpern-Felsher, 2009), our results indicate that risk perception of tobacco does not deter these children and adolescents from intending to try tobacco. Approximately 86% of those intending to try tobacco believe that all tobacco products are dangerous. It has been found that tobacco use is less likely in youth who believe the health effects of tobacco use occur in a short time compared to those who think the health effects occur after a long period of time (Gerking & Khaddaria, 2012). This contrast may be due to differences in the assessment of risk perception. However, it is also known that people may engage in risky behaviors or lifestyles due to optimistic bias -- minimizing their susceptibility or risk while maximizing others (Klein & Helweg-Larsen, 2002). Further, given that tobacco use in Appalachian Tennessee is marked by cultural tolerance, diminished access to preventative resources, and a low political will to enforce or expand tobacco-free policies (Mamudu et al., 2015), it is not surprising, and perhaps understandable, that the adolescents in this study expressed risky choices about tobacco and their health.

The tobacco companies look for opportunities to attract new consumers, and youth are more susceptible to advertising and promotion by the tobacco industry. In this respect, studies have reported that children and adolescents who own or are receptive to tobacco promotional items are more likely to initiate tobacco use (Biener & Siegel, 2000). Additionally, exposure to tobacco advertisements and promotion of tobacco products may influence children to initiate smoking (Hanewinkel, Isensee, Sargent, & Morgenstern, 2010; Henriksen et al., 2010; Lovato et al., 2011). Despite the policies that restrict tobacco marketing and

promotion in the U.S., about 54% of the participants with intention to try tobacco reported owning tobacco-branded item(s). This result is consistent with literature that show that ownership of tobacco-branded items is associated with increased odds of intention to try tobacco in the next year (Biener & Siegel, 2000). In fact, there was more than a sevenfold increase in the odds of intention to try tobacco in participants who reported owning these items compared to those who do not. This highlights the need for strong regulations that reduce access to tobacco-branded items in minors.

The results also suggest that there is not only high access to tobacco-branded item(s), but there is also a large number of these youth who also believe that they can easily access to tobacco. This belief was significantly associated with intention to try tobacco in the next year. While the present study cannot explain how this belief reflects reality, evidence from previous research indicates that, nationally, current use of e-cigarettes increased from 0.6% in 2011 to 5.3% in 2015 among middle school students and from 1.5% in 2011 to 16.0% in 2015 among high school students (Singh et al., 2016). These findings suggest that e-cigarettes are accessible to youth in the U.S. Additionally, due to the lack of regulation, as of March 2017, a pack of two cigarillos or little cigars coming with a choice of flavors was sold for \$0.99 in the U.S. (Smoker's Outlet Online, 2017), making it affordable to youth. While these observations give weight to participants' assertion that they could easily access tobacco, further studies are required to examine how easy it is for minors to access tobacco in this region.

The ecological model of health illuminates how interpersonal relations affect an individual's health behavior (USDHHS, 2012b). Consistently, family and peer influences on tobacco use among youth have been reported (de Vries, Engels, Kremers, Wetzels, & Mudde, 2003; Villanti et al., 2011), and exposure to secondhand smoke has been found to increase the chances of children becoming tobacco users in adulthood (Voorhees et al., 2011; Wang et al., 2011). Consistently, we found that living with tobacco user(s), living in homes where smoking is allowed, and believing that tobacco smokers have more friends are independently associated with increased odds of intention to try tobacco. While longitudinal studies are required to better characterize intention to use tobacco in this population, the findings of this study suggest the need for school-based tobacco intervention programs to supplement the population-based anti-tobacco campaigns. These interventions should seek to replace positive images of tobacco with negative ones to make tobacco unappealing to youth. School children living with tobacco users may need more counselling to reduce the likelihood of developing positive attitudes towards tobacco use.

In interpreting the findings of this study, readers should consider the following limitations. First, the use of cross-sectional data means that causal inferences cannot be made from the results. Second, since the data were collected through self-reports, readers should be aware that the data may be susceptible to social desirability bias. However, the reliability of self-reports can be significantly improved with assurance of confidentiality (Caraballo, Giovino, & Pechacek, 2004), as was done in this study. Third, the use of a convenience sample limits generalizability of the results. Fourth, unlike the assessment of susceptibility with three items that requires non-susceptible participants to affirm their intention not to use tobacco on all three items (Bunnell et al., 2015; Choi et al., 2001; Pierce et al., 1996), intention to try

tobacco in this study was measured with only one item, hence the proportion of participants with intention to try tobacco in this study may be less than the proportion of susceptible participants. Fifth, although we found no sex differences in intention to try tobacco, evidence suggests that sex may interact with other factors to influence tobacco smoking intentions (Cremers et al., 2015). Therefore, this study cannot tell if the associated factors differ by sex. Sixth, we could not consider other important factors in tobacco use initiation, including the use of other substances, impulsivity, and socioeconomic status. Seventh, because of the agreement with the participating schools, we could not account for the nesting of students in schools because school level data were not available.

Despite these limitations, this study is responsive to both national and states' efforts for tobacco control in high risk populations and provides important results to spur monitoring of youth tobacco use behavior in this high-risk population, and policy measures to control tobacco in this region. Thus, this paper fills a major research vacuum in Tennessee and the entire Central Appalachian region.

In conclusion, a concerning proportion of the participants intend to try tobacco in the next year. Tobacco promotions and interpersonal factors are significantly associated with the intention to try tobacco. The present study provides a baseline for monitoring intention to use tobacco in this high-risk population, and the results suggest the need to implement strong school-based anti-tobacco programs in the midst of tobacco preemption laws that prevent local tobacco policies and regulations.

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Table 1:

Ascertainment and definition of study variables

Study measures	Youth Tobacco Survey (YTS) items	YTS item responses	Categorization
Status determination			
Current tobacco use	During the past 30 days, on how many days did you use tobacco products?	0–30 days	N=0 Yes= 1–30
Dependent variable			
Intention to use tobacco	Do you think that you will try a tobacco product any time in the next year?	A. Definitely yes; B. Probably yes C. Probably not D. Definitely not	Yes= A, B, or C No=D
Independent variables			
Ever use tobacco	Which of the following tobacco products have you ever tried, even just one time? (YOU CAN CHOOSE MORE THAN ONE ANSWER)	A. Cigarettes B. Flavored cigarettes, such as Camel Crush or menthol C. Chewing tobacco, snuff, or dip such as Redman or Skoal D. Cigars or cigarillos (little cigars) E. Smoking tobacco from a hookah or waterpipe F. Snus, such as Camel or Marlboro Snus G. Dissolvable tobacco products, such as Ariva, Stonewall, Camel orbs, Camel sticks, or Camel strips H. Clove cigars I. Use electronic cigarettes J. Some other new tobacco products not listed here K. I have never tried any of the products listed above or any new tobacco product	Yes= A, B, C, D, E, F, G, H, I or J No=K
Believe smokers have more friends	Do you think young people who smoke cigarettes have more friends?	A. Definitely yes B. Probably yes C. Probably not D. Definitely not	Yes= A, B, or C No= D
All tobacco products are dangerous	How strongly do you agree or disagree with the statement 'All tobacco products are dangerous'?	A. Strongly agree B. Agree C. Disagree D. Strongly disagree	Yes= A or B No= C or D
Owned tobacco-branded items	Have you ever bought or received anything such as a lighter, t-shirt, hat, sunglasses, or other items that have a tobacco brand name or picture on it?	A. Yes B. No	
Home smoking rule	Inside your house, smoking is...	A. Always allowed; B. Allowed only at some times or in some places; C. Never allowed	Allowed=A or B Not allowed= C
Living with tobacco user	Does anyone who lives with you now ... (YOU CAN CHOOSE MORE THAN ONE ANSWER)	A. Smoke cigarettes B. Use chewing tobacco, snuff, or dip C. Use snus D. Smoke cigars, cigarillos, or little cigars E. Smoke tobacco using a hookah or waterpipe	No=K Yes= any other response

Study measures	Youth Tobacco Survey (YTS) items	YTS item responses	Categorization
		F. Smoke tobacco out of a pipe other than a hookah or waterpipe G. Smoke bidis (small brown cigarettes wrapped in a leaf) H. Smoke clove cigarettes I. Use any other form of tobacco J. Use electronic cigarettes K. No one who lives with me now uses any form of tobacco	
Perceived easy access to tobacco products	How easy would it be for you to get tobacco products if you wanted some?	A. Very easy B. Somewhat easy C. Not easy at all	Yes=A or B No= C
Age	How old are you?	[Indicate the actual age]	1= less than 13 years 2=13 years and above
Sex	What is your sex?	A. Male B. Female	1=Male 0=Female

Table 2:

Characteristics of study participants (N=539)

Variable	n	Percent (%)	Prevalence of intention to try tobacco
Sex			
Females	279	51.8	12.2
Males	251	46.6	29.1
Unknown	9	1.7	11.1
Age			
10 – 12 years old	206	38.2	13.1
13 – 15 years old	333	61.8	24.3
Grade			
6th grade	141	26.3	12.8
7 th grade	157	29.1	15.9
8 th grade	239	44.3	27.2
Unknown grade	2	0.4	0.0
Ever tried tobacco product			
No	478	86.6	12.8
Yes	61	11.4	78.1
Home smoking rule			
Not allowed	377	69.9	8.2
Allowed	152	28.2	50.7
Unknown	10	1.9	0.0
Own tobacco-branded item(s)			
No	463	85.8	10.6
Yes	75	14.0	77.3
Unknown	1	0.2	100.0
Live with tobacco user			
No	258	48.2	2.7
Yes	260	47.5	36.9
Unknown	21	3.9	23.8
Believe tobacco users have more friends			
No	262	48.6	5.3
Yes	274	50.8	33.9
Unknown	3	0.6	33.3
Believe all tobacco products are dangerous			
No	42	7.8	21.4
Yes	490	90.9	19.8
Unknown	7	1.3	33.3
Perception of how easy to get tobacco			
Not easy	331	61.4	7.0
Easy	170	31.5	49.4
Unknown	38	7.1	2.6

Variable	n	Percent (%)	Prevalence of intention to try tobacco
Intention to use tobacco			
No	425	78.9	
Yes	108	20.0	
Unknown	6	1.1	

P-values were derived from chi-square tests to compare the prevalence of intention try tobacco in the categories of each independent variables

Table 3:

Factors associated with intention to try tobacco product among middle school students (N=539)

Effect	OR	95% CI	P-value
Sex			
Female	1.00		
Male	0.65	0.31 – 1.39	0.268
Age			
<13 years	1.00		
13 – 15 years	0.61	0.29 – 1.28	0.189
Ever tried tobacco product			
No	1.00		
Yes	4.66	1.82 – 11.9	0.001
Home smoking rule			
Not allowed	1.00		
Allowed	2.69	1.28 – 5.66	0.009
Own tobacco-branded item(s)			
No	1.00		
Yes	8.11	3.49 – 18.85	<0.001
Live with tobacco user			
No	1.00		
Yes	3.23	1.25 – 8.34	0.015
Believe tobacco users have more friends			
No	1.00		
Yes	2.58	1.18 – 5.64	0.017
Believe all tobacco products are dangerous			
No	1.00		
Yes	0.85	0.27 – 2.266	0.780
Perception of how easy to get tobacco			
Not easy	1.00		
Easy	4.26	1.97–9.22	<0.001

Note: OR, odds ration; CI, confidence intervals. Estimates were derived from logistic regression model in Mplus version 7.4.