Predictors of regular cigarette smoking among adolescent females: Does body image matter?

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Abstract

This study examined how factors associated with body image predict regular smoking in adolescent females. Data were from the National Longitudinal Study of Adolescent Health (Add Health), a study of health-related behaviors in a nationally representative sample of adolescents in grades 7 through 12. Females in Waves I and II (n=6,956) were used for this study. Using SUDAAN to adjust for the sampling frame, univariate and multivariate analyses were performed to investigate if baseline body image factors, including perceived weight, perceived physical development, trying to lose weight, and self-esteem, were predictive of regular smoking status 1 year later. In univariate analyses, perceived weight (p<.01), perceived physical development (p<.0001), trying to lose weight (p<.05), and self-esteem (p<.0001) significantly predicted regular smoking 1 year later. In the logistic regression model, perceived physical development (p<.05), and self-esteem (p<.001) significantly predicted regular smoking. The more developed a female reported being in comparison to other females her age, the more likely she was to be a regular smoker. Lower self-esteem was predictive of regular smoking. Perceived weight and trying to lose weight failed to reach statistical significance in the multivariate model. This current study highlights the importance of perceived physical development and self-esteem when predicting regular smoking in adolescent females. Efforts to promote positive self-esteem in young females may be an important strategy when creating interventions to reduce regular cigarette smoking.

Introduction

Prior research has shown that the causes of initiating and maintaining smoking among females may be quite different from those of males (Attie & Brooks-Gunn, 1987; Fulkerson & French, 2003; Potter, Pederson, Chan, Aubout, & Koval, 2003; Vidrine, Anderson, Pollak, & Wetter, 2006). Concerns about weight may be one such factor that influences smoking among females. Adolescent females report being more concerned about their weight than males (Attie & Brooks-Gunn, 1987; George & Johnson, 2001) and a greater number of females tend to consider themselves overweight compared to males (Winter, de Guia, Ferrence, & Cohen, 2002). In the United States, there has been an increased value placed on the thin ideal for women (Sypeck, Gray, & Ahrens, 2004) and tobacco advertising

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has often capitalized on this by using young, thin models to promote the idea that smoking is linked to beauty (French & Perry, 1996). This may have an impact, as females are more likely than males to believe that smoking helps them control their weight (Charlton, 1984; George & Johnson, 2001; Klesges, Elliott, & Robinson, 1997) and report using cigarette smoking as a method of weight control (Camp, Klesges, & Relyea, 1993; French & Perry, 1996; French, Perry, Leon, & Fulkerson, 1994; Gerend, Boyle, Peterson, & Hatsukami, 1998; Klesges & Klesges, 1988; Klesges, Mizes, & Klesges, 1987).

The purpose of the current study is to prospectively examine how an assemblage of different variables related to weight and body image at baseline may impact regular smoking in adolescent females at follow-up. While prior research has examined how weight concerns may affect smoking initiation (Austin & Gortmaker, 2001; Cawley, Markowitz, & Tauras, 2004; French et al., 1994; Honjo & Siegel, 2003; Robinson, Klesges, Zbikowski, & Glaser, 1997; Tomeo, Field, Berkey, Colditz, & Frazier, 1999) very few have examined the impact on regular smoking. Body image is a person's subjective perspective about one's body or physical appearance. Drawing from the literature concerning both eating disorders and obesity, the current study attempts to build a more comprehensive definition of body image. While a focus of much of this literature includes factors such as perception of one's own weight and trying to lose weight (Fulkerson & French, 2003; Strauss & Mir, 2001), some research includes more broad concepts such as self-esteem and appearance comparison with others (Croghan et al., 2006; Jones, 2001; Krones, Stice, Batres, & Orjada, 2005; O'Dea & Abraham, 2000). Body image is defined in this study by the following variables available in the Add Health dataset: perceived body weight, perceived physical development, trying to lose weight, and self-esteem. This study utilizes longitudinal data to examine how these specific factors related to weight and body image may impact regular smoking in adolescent females.

Body image and smoking are interrelated, especially among females. Female smokers have higher levels of body image dissatisfaction than male smokers (Croghan et al., 2006). Females with more negative views of their bodies are more likely to smoke and a positive relationship has been found for females who express more weight concerns in general and smoking (Camp et al., 1993; Charlton, 1984; French et al., 1994). Young smokers who smoke more days show a decrease in body image satisfaction (Croghan et al., 2006) and adolescents even contemplating smoking show an increase in weight concerns (Tomeo et al., 1999).

Females' perceived importance of being thin predicts smoking behavior (Honjo & Siegel, 2003). Daily smokers have been shown to score higher than those who have never smoked on the drive for thinness subscale from the Eating Disorders Inventory, which measures the level of preoccupation with weight and the pursuit of thinness (Voorhees, Schreiber, Schumann, Biro, & Crawford, 2002). Therefore, examination of the relationship between regular smoking and body image may be especially important. To date, only one study prospectively examined the relationship between weight concerns and smoking and found that female adolescents who reported a fear of weight gain or a strong wish to be thin were twice as likely as girls not reporting these concerns to be current smokers (French et al., 1994).

Smoking for weight control purposes plays a significant role on smoking status among females (Weekley, Klesges, & Reylea, 1992). One study found that the single best predictor of regular smoking was using cigarettes as a weight control method (Robinson, et al., 1997). The association between trying to lose weight and smoking has been shown to differ by age such that adults younger than 30 who were trying to lose weight were more likely to smoke and those older than 30 who were trying to lose weight were less likely to smoke compared

to those not trying to control their weight (Wee, Rigotti, Davis, & Phillips, 2001). This relationship may also differ by actual weight. Strauss and Mir (2001) found a significant two-fold increase in smoking prevalence among normal weight adolescent females who reported trying to lose weight compared to those not trying to lose weight (23.7% vs. 12.6%). Interestingly, smoking prevalence was similar in overweight females trying or not trying to lose weight (15.8% vs. 14.1%). In terms of beliefs that smoking helps control weight, research has shown that adolescent smokers who weigh more were more likely to agree that smoking controls weight (42.2%) compared to people who never smoked (16.6%) and agreement increased as levels of smoking increased (Charlton, 1984). Given the results of these studies, it is apparent that weight is an important factor to control for when examining the relationship between body image and smoking.

Puberty can be a particularly challenging time of life for young females. Research has shown that pubertal timing may be associated with engaging in problem behaviors, such as smoking (Dubas, Graber, & Petersen, 1991; Lanza & Collins, 2002; Stice, Presnell, & Bearman, 2001; Wichstrom, 2001). However, research has not established how adolescent's *perceptions* of their development in relation to others may impact smoking behavior. Social comparison involves evaluating oneself or one's own behavior to others. Social comparison is involved in both body image (Carlson, 2004) and smoking (Spijkerman, van den Eijnden, & Engels, 2005), therefore there may be an important relationship between these comparison processes and regular smoking behavior, especially among adolescent females. Adolescents look to similar others to gain information about themselves. It is quite possible that how developed a young female perceives herself to be in comparison to others may be predictive of regular smoking.

Self-esteem is related to a person's overall self-evaluation and may also play an important role in leading to regular smoking. Poor body image has been associated with decreased self-esteem and research has shown that young females tend to have lower self-esteem than males (Croghan et al., 2006). A strong relationship between low self-esteem and negative body image exists in adolescents (Davison & McCabe, 2006). Additionally, self-esteem has been shown to differ between smokers and nonsmokers such that smokers tend to have lower self-esteem than nonsmokers (Croghan et al., 2006). Research has shown that the relationship between self-esteem and smoking differs by gender. Although no significant relationship between self-esteem and smoking was established for adolescent males, a significant relationship was found between self-esteem and smoking for adolescent females such that those with low self-esteem had a greater likelihood of smoking (Abernathy, Massad, & Romano-Dwyer, 1995). For these reasons, self-esteem is an important construct to include when studying the complex relationship between body image and smoking.

Thus, it has been established that a number of factors associated with body image appear to be linked to various aspects of smoking among young women. However, to date, research has not focused on the relationship between body image and regular smoking, since adolescence is viewed as a time of transition to or experimentation with smoking, rather than stable smoking patterns. The current study attempts to establish variables related to body image which are related to regular smoking status, rather than smoking uptake. Although the literature has examined the independent effects of body image variables on smoking, few studies have considered the constellation of these factors in a single study. In addition, little research has considered the longitudinal effects that body image may have on smoking behavior, especially in a large scale, nationally representative sample. The current study will examine various body image factors in order to ascertain the multifaceted way in which these variables may influence regular smoking among a nationally representative sample of female adolescents. The variables associated with body image explored in this study are perceived body weight, perceived physical development, trying to lose weight, and self-

esteem. Other factors that are likely to impact smoking in young females were controlled for including regular smoking status at Wave I, grade in school, ethnicity, peer smoking status and body mass index (BMI).

Methods

Participants and procedure

The National Institutes of Health Institutional Review Board approval was obtained for analysis of the data set. Data for this study are from a sub-sample of the National Longitudinal Study of Adolescent Health (Add Health) (Harris et al., 2003). Add Health is a school-based study of adolescent health-related behaviors. The sampling frame involved the selection of a random sample of 80 high schools and 54 associated feeder schools throughout the United States. The Add Health sample is representative of U.S. schools with respect to region, urbanicity, school size, school type, and ethnicity. Data were collected in participants' homes and all responses were recorded onto laptop computers. A computer-assisted personal interview was conducted by an interviewer. For more sensitive topics, participants responded via audio computer-assisted self interview.

A sample of 20,745 male and female adolescents in grades 7 through 12 participated in the initial in-home survey conducted between April and December 1995 (Wave I). All study variables were measured at Wave I. The sample size for females at Wave I was 13,570. Participants were interviewed a second time approximately 1 year later (Wave II) where regular smoking status was assessed. To be included in the current analyses, participants had to be female and have data available from both waves, having participated in the appropriate assessments. The final sample selected for this study was 6,956 young women.

Measures

Regular smoking status (Wave II)—Regular smoking status was the outcome variable of interest. Of the participants who reported ever trying cigarette smoking, they were further asked, "Since (month and year of last interview), have you ever smoked cigarettes regularly, that is, at least one cigarette every day for thirty days?" Responses were coded 0 (*no*) or 1 (*yes*). Participants who responded that they had never tried a cigarette were coded as 0.

Perceived body weight (Wave I)—Participants were asked, "How do you think of yourself in terms of weight?" Response options included very underweight, slightly underweight, about the right weight, slightly overweight, and very overweight. This variable was recoded into three categories: underweight (very underweight and slightly underweight), about the right weight, and overweight (slightly overweight and very overweight).

Perceived physical development (Wave I)—Participants were asked, "How advanced is your physical development compared to other girls your age?" Response options included younger than most, younger than some, about average, older than some, and older than most. For interpretation purposes, in the univariate analysis perceived physical development was categorical, but changed to continuous for the logistic regression analysis.

Trying to lose weight (Wave I)—Participants were asked, "Are you trying to lose weight, gain weight, or stay the same weight?" Respondents who reported trying to lose weight were coded as 1; all other responses were coded as 0.

Self-esteem (Wave I)—Seven items assessed self-esteem: 1) You have a lot of good qualities, 2) You are physically fit, 3) You have a lot to be proud of, 4) You like yourself

just the way you are, 5) You feel like you are doing everything just about right, 6) You feel socially accepted and 7) You feel loved and wanted. Responses to each were made on a 5-point agree-to-disagree scale and were reverse scored so that higher scores indicated higher levels of self-esteem. The items had an alpha coefficient of 0.85. The self-esteem score was the average of the seven items, ranging from 1 to 5.

Regular smoking status (Wave I)—Participants who reported ever trying cigarette smoking and how old they were when they smoked a whole cigarette for the first time were asked, "Have you ever smoked cigarettes regularly, that is, at least one cigarette every day for thirty days?" Responses were coded 0 (*no*) or 1 (*yes*). Those who did not report trying a cigarette or age they smoked a whole cigarette for the first time were coded as 0.

Grade (Wave I)—Participants reported what grade they were currently in or, if it if was summer, what grade they had just completed. Responses ranged from 7th to 12th grade and a category was also included for adolescents who reported not being in school.

Ethnicity (Wave I)—Six ethnic-racial groups were created based on self-reported data: non-Hispanic White, non-Hispanic Black, non-Hispanic Asian, non-Hispanic Native American, non-Hispanic other, and Hispanic.

Peer smoking status (Wave I)—All participants were asked, "Of your three best friends, how many smoke at least one cigarette a day?" Responses were coded 0 (*no friends*), 1 (*one friend*), 2 (*two friends*) and 3 (*three friends*). For interpretation purposes, in the univariate analysis peer smoking status was categorical, but changed to continuous for the logistic regression analysis.

BMI (Wave I)—Body Mass Index (BMI) is a calculation of an individual's height to weight ratio. BMI is a reliable indicator of body fatness for most children and teens and is used as a screening tool to identify possible those at risk for being overweight (Centers for Disease Control and Prevention [CDC], 2006). BMI is determined by the following formula:

$$BMI = Weight(kg)/Height(meters)^2$$

The CDC National Center for Health Statistics provides guidelines which allow one to compare the BMI of individuals to the appropriate age- and gender-specific growth charts based on a nationally representative reference. In the current study, BMI was calculated from participants' self-reported height and weight. Research testing the reliability of self-reported BMI was conducted using the Add Health data set and results showed that BMI based on self-reported height and weight correctly classified 96% as to obesity status (Goodman, Hinden, & Khandelwal, 2000). BMI percentiles were calculated based on age for each participant to determine which of four classifications they fell into defined by the CDC (2006): underweight (less than the 5th percentile), healthy weight (5th percentile up to the 85th percentile), at risk of overweight (85th percentile up to the 95th percentile) and overweight (equal to or greater than the 95th percentile).

Data analysis

SUDAAN 9.0 (Research Triangle Institute, 2001) was used in order to correct for design effects and unequal probability of selection and to ensure that the results were nationally representative with unbiased estimates. Cross-tabulations with chi-square were used to assess the bivariate relationships for categorical variables and *t*-tests were used for continuous variables. Univariate analyses are presented as model building adjusting for

multiple comparisons. Variables that were significant in the unadjusted analyses were included for consideration in the multiple regression model. A multivariate analysis was performed using logistic regression to assess predictors of smoking at Wave II. BMI, despite not reaching significance in the univariate analysis, was included due to its potential relation with other variables of interest. Variables included in the final model were: perceived body weight, perceived physical development, trying to lose weight, self-esteem, regular smoking status at Wave I, grade, ethnicity, peer smoking status, and BMI. Although not all variables were significant in the multivariate analyses, we retained them in the model due to potential theoretical importance. After accounting for all variables in the multivariate model, the final sub-sample for this analysis involved 6,510 females.

Results

Univariate analyses

Table 1 shows data comparing the characteristics of Wave II regular smokers and non-regular smokers based on Wave I variables and the p values for the univariate analyses. Of adolescents who reported not being a smoker at Wave II, 93.3% had not been smokers at Wave I and 6.7% had been smokers at Wave I ($p < .0001$). Of adolescents who were a smoker at Wave II, 35.5% reported not being a smoker at Wave I and 64.5% reported being a smoker at Wave I ($p < .0001$). Individuals in lower grades were less likely to be smokers at Wave II ($p < .0001$). Overall, smokers at Wave II were more likely to be White, followed by Latino, Black, Asian, Other, and Native American ($p < .0001$). Adolescents who had no peers who smoked were more likely to be non-smokers (66.4%) and those who had at least three peers who smoked were more likely to be smokers (36.1%) ($p < .0001$). BMI was not significantly predictive of smoking.

Body image variables—Perceived body weight at Wave I was significantly predictive of smoking at Wave II ($p < .01$). There were a greater percentage of people who perceived themselves as being overweight who were smokers than those who were non-smokers. Perceived physical development at Wave I was significantly predictive of smoking at Wave II ($p < .0001$), with those who reported being smokers being more likely to describe themselves as appearing to be older than some or most of their peers. Trying to lose weight at Wave I was a significant predictor of smoking at Wave II ($p < .05$). A larger percentage of smokers than nonsmokers at Wave II reported that they were trying to lose weight (51.6% vs. 46.0%). Those who were non-smokers had a significantly higher mean self-esteem score than those who were smokers ($p < .0001$).

Logistic regression

Table 2 summarizes the results of the logistic regression model which examines the predictive value of body image variables at Wave I on regular smoking at Wave II controlling for potential confounders. The greatest predictor of smoking at Wave II was reporting being a regular smoker at Wave I ($OR = 11.40$, $CI = 8.95–14.53$, $p < .0001$). Grade was not a significant predictor of smoking. In comparison to Whites, all other racial and ethnic groups were at decreased odds for smoking at Wave II ($p < .0001$). The odds of smoking almost doubled as the number of smoking peers increased ($OR = 1.96$, $CI = 1.79–2.13$, $p < .0001$). For BMI, those who were underweight had increased odds of being a smoker whereas those who were overweight or at risk of being overweight had decreased odds of being a smoker; however this relationship did not reach statistical significance.

Perceived body weight at Wave I was not a significant predictor of smoking status at Wave II. Perceived physical development at Wave I was a significant predictor of smoking at Wave II ($OR = 1.12$, $CI = 1.01–1.25$, $p < .05$). Trying to lose weight at Wave I was not a

significant predictor of smoking at Wave II. Self-esteem at Wave I was a significant predictor of smoking at Wave II, with higher self-esteem associated with lower odds of smoking (OR=0.71, CI=0.58–0.87, p<.001).

Discussion

The purpose of this study was to build on the existing knowledge of the complex relationship between body image and smoking in a nationally representative sample of female adolescents. Based on our longitudinal analysis of Add Health data, we found factors that were predictive of regular smoking status among female adolescents. Body image was defined by the following set of variables available in the Add Health dataset: perceived weight, perceived physical development, trying to lose weight, and self-esteem. Preliminary results indicated that the bivariate relationships between each of these variables and regular smoking status approximately 1 year later were all statistically significant. This finding highlights the importance of these body-image-related factors in research concerning regular smoking in adolescent females. Of greatest interest to the goals of this study, perceived physical development and self-esteem significantly predicted regular smoking status after controlling for the other body image factors and highly predictive variables in the logistic regression model.

Perceived physical development significantly predicted smoking in the logistic regression analysis. Females who perceive themselves as looking older than their peers were more likely to smoke. This is in accordance with prior research that has shown an association between puberty and engaging in risky behaviors (Chung, Park, & Lanza, 2005; Martin et al., 2002). The current research suggests that self-image in comparison to others plays an important role in predicting behavior. Young females may often strive to look older than they truly are, which may be due to cultural importance placed on perceived physical development and ideals of attractiveness. It may be that adolescent females who perceive themselves as looking older than their peers smoke in part because it is an adult activity that they believe facilitates their older image. Another possible explanation for the relationship of perceived physical development and regular smoking is that females who perceive themselves as looking older than others their age may be more likely to associate with an older peer group who are in turn more likely to be smokers. Since peer smoking status was controlled for in the multivariate analysis in the current study and perceived physical development remained a significant predictor of regular smoking, we concluded that perception of development may be an important predictor of regular smoking above and beyond peer smoking.

Self-esteem was also a significant predictor of smoking in the logistic regression model, such that higher self-esteem was predictive of being a non-smoker. This is consistent with prior research that has shown that low self-esteem is associated with smoking (Croghan et al., 2006). Lower self-esteem is also related to poor body image, especially among young females (Davison & McCabe, 2006). One could think of body image as being a component of self-esteem. The results of this study suggest that overall self-esteem may be important in predicting regular smoking among adolescent females. Because self-esteem has been shown to be related to both smoking and poor body image, this is an important and complicated set of variables to explore.

A more general variable, self-esteem, may be more central in predicting regular smoking than more specific variables that are related to body image. Although significant at the univariate level, the variables which may be most directly related to body image, perceived body weight and trying to lose weight, did not significantly predict smoking in the logistic regression model. Prior research has shown no significant differences in weight concerns in

younger female smokers compared to nonsmokers (Feldman, Hodgson, & Corber, 1985). Thus, our non-significant finding may be explained by our sample of young females. Although weight concerns have been found to correlate with smoking status, prior prospective studies have not been able to establish this relationship (Honjo & Siegel, 2003). Likewise, our longitudinal study failed to find an association between perceived body weight and smoking when controlling for other related variables. Perceived body weight may be an important construct to study when considering smoking behavior as evidenced by its significance in univariate analysis, but when considered among other variables the relationship appears to be complex and warrants further study. The assessment of perceived body weight was limited to a single variable and may have failed to capture the complexity of this construct.

Trying to lose weight was also significant at the univariate level but failed to reach significance in the multivariate model. Prior studies suggesting cigarette smoking as a weight control method in females have yielded conflicting results. Although much research has found a positive relationship between trying to lose weight and smoking, others have not confirmed it (Nichter et al., 2004). Differences in research methods may have produced these discordant results. Additional analyses not published in the current study included particular weight control practices, such as diet and exercise. These specific methods of weight control were not significant predictors of smoking.

The current study did not find a significant relationship between BMI and smoking in univariate or multivariate analyses. BMI was included in the analysis in order to control for actual weight in a model of weight-related variables. The non-significant relationship between BMI and regular smoking indicates that how individuals perceive themselves is more important than their actual weight when predicting regular smoking in female adolescents. The relationship between BMI and smoking is complex. Body weight is lower among smokers (Klesges, Meyers, Klesges, & LaVasque, 1989). Age may play a role such that among teenage females aged 11–18, those who are moderately overweight tend to smoke the most, whereas among females aged 40+ those who are thin smoke (Crisp, Sedgwick, Halek, Joughin, & Humphrey, 1999). Other studies have shown that adolescent females are more likely to smoke if their BMI falls into the CDC categories of "at risk of overweight" or "overweight" (Cawley et al., 2004) or if they are of normal weight trying to lose weight (Strauss & Mir, 2001). Studies may wish to examine the discrepancies between actual BMI and perceived weight in order to understand how this may impact smoking behavior.

As is always a limitation when conducting secondary data analysis, the items are not specifically designed to examine the variables of interest. The measures concerning body image and smoking were limited to few items and may not capture the complexity of these constructs. Drawing from the obesity and eating disorders literature while also building on prior research concerning body image and smoking, we chose the variables we believed to be most appropriate in the Add Health dataset. As is a common problem in longitudinal research, attrition at follow-up occurred. All variables, including smoking behavior, were self-reported. However, previous research indicates that adolescent self-reports of smoking behavior are generally valid (Dolcini, Adler, & Ginsberg, 1996). The use of BMI self-reports have also been shown to be valid (Goodman et al., 2000), however in general, BMI should be used cautiously when assessing obesity in different ethnicities (Dietz & Bellizzi, 1990).

There are pre-existing exposures and outcomes which must be considered when conducting any type of research; however, the interrelations between the variables of interest in the current study make this problem particularly relevant. For instance, young females who are

overweight may have initiated smoking at a young age as a weight reduction strategy prior to enrolment in the study and therefore may have entered the study as an overweight smoker. Although we have controlled for baseline variables which we believe may impact regular smoking at Wave II (e.g. regular smoking at Wave I and BMI), this is a limitation of the study that should be considered.

Results of this study are provocative, but certainly not definitive. This study focused on several issues that have not been addressed in prior research. First, very little research on body image and smoking has utilized a longitudinal design. The advantage of a prospective study is that it enables us to understand how factors related to body image at one point in time may influence regular smoking at a future time point. In addition, few studies have examined these issues in nationally representative samples. This sample provides an advantage in that it mirrors the characteristics of the population from which it was drawn. Finally, this study examines how issues surrounding body image may impact regular smoking, as opposed to smoking uptake. This is an understudied but important area of research because many adolescents report regular cigarette use.

This study examined a longitudinal, nationally representative sample of female adolescents. Results point to several factors that may impact subsequent smoking behavior. Given the severe health consequences of smoking, it is important to gain a better understanding of the nature of what causes individuals to smoke. This study considered multiple body image variables while controlling for other highly predictive variables of regular smoking, thus establishing the importance of perceived physical development and self-esteem in predicting regular smoking in adolescent females. These two aspects of body image, perceived physical development in relation to others, and self-esteem, are important constructs to consider when designing cigarette smoking interventions for young females.

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Table 1

SUDAAN-adjusted characteristics of regular smokers vs. Smokers at Wave II.

Variable	Not regular smokers (n=5,530)	Regular smokers (n=1,389)	p value[a]
Regular smoking status (Wave I)			
Non-smoker	93.3%	35.5%	<.0001
Smoker	6.7%	64.5%	
Grade (Wave I)			
7th	22.5%	12.5%	<.0001
8th	19.4%	15.7%	
9th	18.7%	22.6%	
10th	19.2%	21.0%	
11th	15.8%	19.9%	
12th	3.1%	4.3%	
Not in school	1.3%	4.2%	
Ethnicity (Wave I)			
White	63.4%	83.8%	<.0001
Black	18.7%	3.7%	
Native American	0.5%	0.5%	
Asian	3.6%	1.4%	
Other	1.1%	0.9%	
Latino	12.8%	9.6%	
Peer smoking status (Wave I)			
0	66.4%	17.6%	<.0001
1	20.1%	22.3%	
2	8.4%	24.1%	
3	5.1%	36.1%	
BMI (Wave I)			
Underweight	2.9%	3.2%	n.s.
Healthy weight	73.7%	76.3%	
Risk of overweight	14.5%	12.5%	
Overweight	9.0%	8.0%	
Perceived weight (Wave I)			<.01
Underweight	11.4%	10.0%	
About right weight	50.0%	44.3%	
Overweight	38.6%	45.7%	
Perceived physical development (Wave I)			<.0001
Younger than most	8.9%	5.6%	
Younger than some	11.1%	7.2%	
Average	40.7%	32.0%	

Variable	Not regular smokers (*n*=5,530)	Regular smokers (*n*=1,389)	*p* value[a]
Older than some	27.3%	36.8%	
Older than most	12.0%	18.4%	
Trying to lose weight (Wave I)			<.05
No	54.0%	48.4%	
Yes	46.0%	51.6%	
Self-esteem (Wave I)			<.0001
Mean	4.0	3.8	

Note.

[a] *p* value corresponds to chi-square for all categorical variables and *t*-test for continuous variables.

Table 2

Odds ratios (*OR*) and 95% confidence intervals based on logistic regression analysis.

	OR	*95% CI*	*p* value[a]
Regular smoking status (Wave I)			
Non–smoker	1.00	–	<.0001
Smoker	11.40	8.95–14.53	
Grade (Wave I)			
7th	1.00	–	*ns*
8th	1.10	0.75–1.61	
9th	1.22	0.79–1.88	
10th	1.06	0.71–1.57	
11th	0.95	0.63–1.44	
12th	1.25	0.74–2.11	
Not in school	1.72	0.88–3.36	
Ethnicity (Wave I)			
White	1.00	–	<.0001
Black	0.33	0.22–0.51	
Native American	0.25	0.09–0.71	
Asian	0.52	0.35–0.77	
Other	0.97	0.49–1.90	
Latino	0.87	0.60–1.24	
Peer smoking status (Wave I)	1.96	1.79–2.13	<.0001
BMI (Wave I)			
Underweight	1.18	0.63–2.24	*ns*
Healthy weight	1.00	–	
Risk of overweight	0.77	0.53–1.13	
Overweight	0.68	0.47–0.98	
Perceived weight (Wave I)			
Underweight	0.94	0.60–1.48	*ns*
About right weight	1.00	–	
Overweight	0.96	0.64–1.44	
Perceived physical development (Wave I)	1.12	1.01–1.25	<.05
Trying to lose weight (Wave I)			
No	1.00	–	*ns*
Yes	0.97	0.71–1.34	
Self–esteem (Wave I)	0.71	0.58–0.87	<.001

Note.

[a]Based on Wald chi–square *p* value.