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A Comparison of Tobacco-Related Risk Factors Between Preadolescents With and Without Cancer

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Abstract

Introduction—To compare preadolescents with and without cancer on current smoking status, future intentions to smoke, and tobacco-related risk factors, as well as to explore the relationship between cancer status and tobacco-related variables with intentions.

Procedure—Ninety-four preadolescents undergoing treatment for cancer and a matched comparison sample of 190 participants without cancer, ages 8 to 11 years, completed questionnaires about their smoking habits, intentions to smoke and tobacco-related psychosocial risk factors.

Results—No preadolescents with cancer and only two preadolescents without cancer reported current smoking. Compared to healthy nonsmoking preadolescents, nonsmokers with cancer were approximately one-half as likely to report future intentions to smoke. Intention to smoke was better predicted by variables most proximal to smoking including older age, being male, not having cancer, having close friends who smoke, parental smoking, and lower perceived vulnerability for tobacco-related illnesses. In the model examining distal variables, preadolescents who were more rebellious, older, and without cancer were more likely to report future smoking intentions.

Discussion/Conclusions—Although future intentions to smoke differed according to cancer status, the relationship between tobacco-related risk factors and future smoking intentions appeared to be similar among preadolescents with and without cancer.

Implications for Cancer Survivors—Smoking prevention and tobacco-related health risk education should begin during the elementary years, a time prior to smoking initiation and the development of solidified smoking attitudes. The diagnosis and treatment of pediatric cancer may provide an excellent opportunity for health care providers to begin communicating anti-smoking messages and health risk counseling to their young patients and families.

Keywords

Smoking; preadolescents; tobacco use; pediatric cancer; intentions

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INTRODUCTION

Tobacco use continues to be a leading preventable cause of illness and death in the U.S. [1]. Early health consequences for young smokers include respiratory symptoms and infections, reduced rates of lung growth and function, compromised physical activity, and adverse changes in lipid profiles resulting in cardiovascular sequelae [2]. Tobacco use continuing into adulthood greatly increases one's risk for developing lung and other cancers, heart disease and stroke. These tobacco-related health risks are further magnified among young cancer patients secondary to cardiopulmonary toxic chemotherapies and radiation therapies, which are known to compromise their cardiac, vascular and/or pulmonary functioning [3]. Youngsters treated for cancer are already at risk for developing secondary malignancies because of treatment-induced and genetic predispositions [3,4] which may be exacerbated by tobacco use.

National data indicate that 23% of high-school students are current smokers [5] while one-fifth of high-school students reported smoking before the age of 13 years [6]. Approximately 10% of middle-school and 2% of elementary-school children also currently use tobacco [5-7]. Although smoking rates among pediatric cancer patients are estimated to be between 5-10% [8], one study reported that 48% of adolescents with cancer reported some intention to smoke in the future [9]. Among young adult cancer survivors, Emmons et al [10] found that 17% of patients 18 years and older reported being a current smoker.

As attitudes and behaviors developed during childhood predict smoking behavior in adolescence and early adulthood [11,12], it is important to identify the determinants of smoking behavior during these critical years. A number of risk factors derived from major psychosocial models have been used to explain smoking onset and progression in healthy youngsters [6,7, 13-30]. No single theory can adequately address the complexities of preadolescent smoking behaviors. Differences in age, gender, race and socioeconomic status (SES) add to the complexity of factors that contribute to child and adolescent smoking initiation and future tobacco use [16-18]. In addition to sociodemographic factors, components of the Social Learning Theory [31,32] and the Health Belief Model [24] may be useful in understanding smoking initiation among children and preadolescents. However, how these variables interact must also be considered from a developmental perspective, in that the importance of different predictors of smoking onset may change as children develop [33].

Consistent with a Social Learning Theory framework, social influences such as peer and parent smoking have been consistently demonstrated to play a role in smoking intentions, initiation, and progression among children and adolescents [11,12,16,18-21]. Antismoking socialization variables such as parent-child communication about smoking and adoption of no smoking rules in the home have also been found to influence smoking outcomes among children. For example, Jackson and Henriksen [19] found that children whose parents engaged in antismoking actions or talked to them about smoking had significantly lower rates of smoking onset, even if the parents were smokers.

Other proximal variables that have been identified as contributing to smoking among youth include perceived instrumental value (perceptions of smoking as a way to impress one's peers) and tobacco-related knowledge. Positive perceptions of smoking have also been found to be strong predictors of subsequent smoking among 5^{th}-7^{th} graders [22]. Conversely, adequate knowledge about tobacco-related health risks has been shown to be a protective factor for adolescent smoking [23] but little is known about younger children's understanding of tobacco-related health risks. Tyc and colleagues [9] recently reported that adolescents with and without cancer who had increased perceptions of instrumental value and lower tobacco knowledge were more likely to report future intentions to smoke. Children and adolescents who have

experimented with smoking in the past are also more likely to intend to smoke in the future [9,11].

More distal psychosocial variables, including rebelliousness, optimism, and health value have also been demonstrated to play a role in youth smoking. For example, Burt, Dinh, Peterson and Sarason [26] found that rebelliousness among 5th graders was the strongest predictor of later 12th grade daily smoking. In another study, rebelliousness was the most robust predictor of smoking initiation among 6th grade students regardless of gender [27]. Similarly, youngsters with less optimistic views have also been reported to be more likely to initiate smoking and/or report future intentions to smoke [9,14] and are at greatest risk for the escalation of smoking once having started [28]. Perceived health value and perceptions of general health risks are well recognized components of current health behavior models, such as the Health Belief Model [14,24], that may influence adolescent smoking behaviors. However, these variables have been less extensively studied in preadolescents with and without cancer.

The goal of the present study was to compare the prevalence of current smoking and future intentions to smoke among preadolescents with and without cancer. Self-reported intention to smoke has been used as a proximal outcome measure of smoking with children and consistently demonstrated to be a strong predictor of future smoking behavior [4,6,18,34-38]. We also aimed to explore tobacco-specific and less proximal psychosocial predictors of smoking intentions in preadolescents with cancer, as compared to their healthy peers. This is the first study to compare preadolescents treated for cancer to their healthy peers on a number of tobacco-related risk factors.

METHODS

Participants

The current study included 94 preadolescents currently being treated for cancer (M = 9.3 years, SD = 1.2) and 403 elementary school students without cancer (M = 9.7 years, SD = 0.9). Preadolescents with cancer were eligible for the study if they were 8-11 years of age, spoke English, had a primary diagnosis of malignancy, were in active treatment, and were at least one month from diagnosis. Eligibility criteria for healthy preadolescents required that they be in grades 3-6, speak English, and not be enrolled in special education programs. The school sample was recruited from four local public elementary schools and selected *a priori* in an effort to obtain a comparison group that was demographically similar to the cancer cohort. However, the demographic distributions of the cancer and comparison groups were found to differ significantly. The original healthy school sample (n=403) had more whites, fewer African-Americans, fewer males, and was older than the cancer sample. In order to more closely match the demographic distributions of the two samples for race, gender, and age, a stratified random sampling of approximately 40% of the white participants in the school sample, with strata defined by gender and age (8-9, 10-11 years), was employed. For analyses of nonsmokers based on demographically similar cohorts, the resulting sample sizes were 94 participants in the cancer group and 190 participants in the school sample.

The majority of participants with cancer were from middle to low socioeconomic status (SES) as determined by the Hollingshead (1975) Index, while 25.5% (n=24) were of high SES status [39]. This was consistent with institutional referral patterns. In order to *a priori* approximate the SES status of the cancer sample, schools from middle to low SES levels were selected for inclusion based on the median income for each school's zip code. This indirect estimate of SES was employed because young children in the comparison group could not reliably provide the necessary information about their parents' occupational status to calculate a Hollingshead Index, a more direct measure of SES.

Procedures

Preadolescents with cancer who met our eligibility criteria were recruited during routine clinic visits. Signed informed consent according to institutional guidelines and written assent was obtained. Participants were informed that their responses would remain confidential. Of the 100 eligible patients approached for the study, one was later determined to be ineligible and five refused to participate due to lack of interest or time.

For the original school sample, a consent and description of the study was sent home with 1,009 students. Only students who returned signed parental consent forms and provided assent were permitted to participate in the study. Approximately 45% of students returned them with parental signatures. Of these, 51 (5.1%) parents refused child participation. The participation rate is within the range typically obtained for published studies of preadolescent smoking [32,37]. No preadolescents refused to complete the survey.

Preadolescents in the cancer and school cohorts completed the following measures:

Measures

Smoking Status—Current smoking status was measured by self-report as to whether the preadolescent had smoked a cigarette in the past 30 days [36,40]. Participants were also asked if they had tried smoking in the past, and whether their parents and/or close friends were current smokers.

Smoking Survey—A questionnaire used in previous research to assess a variety of factors thought to be related to smoking onset among youngsters, as indicated below, was included as a primary measure [40-44].

a. Instrumental Value of Smoking: The perceived positive effects of smoking was assessed by summing 16 four-point items, scored from 0 to 3, with higher scores indicating greater instrumental value. Cronbach's alphas for the school and cancer samples were .78 and .86, respectively.

b. Rebelliousness: This scale consisted of five 3-point items assessing rebelliousness and risk taking. Cronbach's alphas were .65 for both the school and cancer samples. These items were scored 0 to 2 and summed with higher scores reflecting greater rebelliousness.

c. Optimism: Preadolescents' general life expectations and optimism were measured using the Youth Life Orientation Test (YLOT) [45]. The responses on the 12-item Total Optimism scale for each item ranged from "true for me" (3) to "not true for me" (0) with possible scores ranging from 0 to 36. Higher scores reflect higher levels of optimism. Cronbach's alphas of . 81 and .74 were obtained for the school and cancer samples, respectively.

d. Health Value: Preadolescents' perception of the importance of their health was assessed by a single item. Scores ranged from 0 to 4 with higher scores indicating greater health value.

e. Perceived Vulnerability (PV) to General Health and Tobacco-Related Problems: PV to general health problems was assessed by a single item. Scores ranged from 0 to 4 with higher scores indicating greater PV to health problems. A six-item scale assessed PV for tobacco-related problems. Items were scored from 0 to 4, with higher scores representing higher levels of PV. Cronbach's alphas of PV for tobacco-related illness were .58 and .57 for those without/ with cancer, respectively.

f. Knowledge: This scale consists of 13 items related to the adverse consequences associated with tobacco use and scored from 0 “disagree a lot” to 4 “agree a lot” (maximum score = 52). Cronbach’s alpha was .70 and .57 for the school and cancer samples, respectively.

g. Intentions: This scale consisted of eight items that measure future intentions to use tobacco as rated on a 5-point scale ranging from “Definitely Not (0)” to “Definitely Yes (4).” Participants reported whether they intended to use tobacco in the next month, 6 months, or the future. Total scores range from 0 to 32 with higher scores reflecting greater intentions to use tobacco. For later analysis, the Intention scale was dichotomized into “no intentions to smoke”(scores = 0) and “some intention to smoke” (scores>0) due to a restricted range on this measure and to better differentiate preadolescents at low vs. high risk for future smoking as suggested in the literature[37]. In previous studies, the Intentions measure demonstrated good internal consistency (.79 [25] to .88 [10]) among adolescents with and without cancer. For nonsmokers in this study, Cronbach’s alpha was .51 and .79 for the school and cancer samples, respectively.

h. Number of Smoking Messages Communicated: This 8 item scale asked respondents whether on not they had heard specific anti-smoking messages. These messages were coded as “yes” (1) or “no” (0) and then summed for a total score.

Data Analysis

To make group (cancer vs. school) comparisons of demographic and psychosocial variables, Mantel-Haenszel chi-square tests for ordinal data and chi square tests for categorical data were used. For continuous data, the nonparametric two-sample Wilcoxon rank sum test was applied, given the generally non-normal distribution of these measures. Logistic regression was used to assess variables in models predicting intentions (none vs. some for nonsmokers) to smoke. To investigate if relationships between psychosocial variables and intentions differed according to group, interactions with group were examined, which was considered exploratory given the number of variables and sample size. Variables that were significant at $p<.20$ were retained in the final models. Two models were fit to investigate proximal tobacco-related and more general (distal) psychosocial variables. A generalized R^2 [46] was reported for each model.

RESULTS

There were no current smokers in the cancer cohort and only 2 current (0.5%) in the original school sample. Given the limited number of current smokers, subsequent analyses are focused on the demographically matched samples of nonsmokers.

Univariate Analyses of Demographic and Psychosocial Variables

The demographic and psychosocial characteristics for nonsmoking preadolescents treated for cancer and without cancer are listed in Table I. The groups did not differ significantly in terms of age, gender, and race/ethnicity.

Healthy preadolescents were more likely to report future intentions to smoke (34.1%) relative to preadolescents with cancer (14.0%, $p<.001$). The percentage of past smokers was similar between preadolescents with cancer (2.2%) and those without cancer (4.9%) and parental smoking did not significantly differ between the groups (40.9% vs. 33.9%, respectively). However, those without cancer were more likely to have at least one close friend who smoked (16.8%) as compared to those with cancer (7.5%, $p=.030$). Compared to preadolescents without cancer, preadolescents with cancer had higher tobacco-related knowledge ($p=.001$), perceived themselves to be more vulnerable to tobacco-related illness ($p<.001$), were more optimistic

(p<.001), and attributed more value to overall health (p=.001). They also perceived themselves to be more vulnerable to general health problems (p<.001), and had lower levels of rebelliousness/risk taking (p=.001) as well as perceived instrumental value of smoking (p=.002).

Univariate Analyses of Cancer-Specific Variables

The median time from diagnosis for the participants with cancer was 3.0 months (range = 1-38 months). At the time of the study, the majority of preadolescents with cancer were outpatients (n=85, 90.4%). Approximately 34% (n=32) of patients were hospitalized in the preceding month with the median number of overnight stays being 5.5 days (range = 1-28 days) for those with stays. Over half (n=50, 53.2%) of the sample was being treated for leukemias/lymphomas, 33.0% (n=31) for brain tumors, and 13.8% (n=13) for solid tumors.

Among preadolescents with cancer, those who were enrolled on the study three or more months from diagnosis were not significantly more likely than those enrolled less than three months from diagnosis to report intentions to smoke (n=7, 15.2% vs. n=6, 12.8%, respectively). Likewise, outpatients were not significantly more likely than inpatients to intend to smoke in the future (n=12, 14.3% vs. n =1, 11.1%, respectively).

Multivariable Analyses

The final multivariable model in Table II that investigated tobacco-specific variables (Model 1) accounted for 32% of the variance in future smoking intentions for current nonsmokers. After controlling for other variables in the model, significant predictors of intentions to smoke in Model 1 were age, gender, group (having cancer or not), parent smoking, peer smoking, and perceived vulnerability to tobacco-related illnesses. Results suggest that preadolescents with cancer were approximately ½ as likely to report intentions to smoke as compared to healthy preadolescents (p=.038). Being male and older in age, in addition to reporting lower perceived vulnerability to tobacco-related illnesses, were also associated with an increased odds for intending to smoke in the future. Preadolescents with parents and peers who smoked were also more likely to intend to smoke in the future.

The final multivariate model that addressed more distal psychosocial variables (Model 2) accounted for 20% of the variance in smoking intentions (See Table III). Significant predictors of intentions to smoke in this model were age, group, and rebelliousness. Adolescents who were older, without cancer, and more rebelliousness were more likely to endorse future intentions to smoke.

In both models, exploratory analyses of interactions between group and proximal and distal psychosocial variables were non-significant (p>.20) indicating the relationship between these variables with intentions did not appear to differ according to having cancer or not.

DISCUSSION

The results of the study found that there were few current smokers among our preadolescent samples, which is generally consistent with other studies examining smoking behaviors among preadolescents [4,18,36]. Among current nonsmoking preadolescents, those with cancer were approximately one-half as likely to report intentions for future smoking as compared to healthy preadolescents. A lower odds of intending to smoke was also reported among adolescents with cancer when compared to healthy adolescents [9]. Children's intentions to smoke have been shown to reliably predict later smoking behavior [36] and suggests that decision making about smoking develops at an early age. In fact, our multivariable analyses suggest that the ages of 8-11 years may be a critical period for a child's development of attitudes about smoking in that

every year of age conferred approximately a 50% increase in the odds of intending to smoke. Greater efficacy in preventing smoking onset among preadolescents, particularly those with cancer, may be achieved by screening and targeting at-risk youngsters who clearly intend to smoke or those who are less committed to future smoking abstinence.

The results of our exploratory multivariable analyses suggest that intentions to smoke are best predicted by tobacco-specific (i.e. proximal) variables. Variables predictive of future intentions to smoke also appeared to be similar among preadolescents with and without cancer. These findings are similar to those reported in our previous work that compared adolescents with cancer to a control group [9]. It should be noted, however, that power was somewhat limited to detect interactions given the small sample size of our cancer cohort. Although a direct comparison of the findings from the adolescent and preadolescent samples cannot be made, differences in the relationship between various risk factors and intentions to smoke in the preadolescent and adolescent samples suggest that factors that influence smoking may change developmentally and that some factors may be more important for different age groups.

The finding that lower perceived vulnerability to tobacco-related illnesses is related to greater intentions to smoke is consistent with the inverse relationship predicted by current health behavior models [24]. Peer and parent smoking was also particularly important in influencing preteen smoking intentions as reported in prior studies that examined these variables [18,19, 47]. These collective findings suggest that smoking prevention interventions with preadolescents should capitalize on their perceptions of vulnerability, teach them strategies to acquire more positive social and self images, as well as resist peer pressure to smoke and promote changes in parental smoking.

Inspection of the psychosocial variables that are less proximal to smoking found that more rebellious preadolescents were more likely to intend to smoke. This same relationship has been previously demonstrated in young smokers [26,48]. The overall minimal long-term impact of smoking prevention interventions may be due to the fact that mainstream children in classroom settings who may be less likely to engage in smoking [22] are typically targeted. One alternative might be to design prevention programs which would be highly attractive to rebelliousness preteens and able to be delivered in non-classroom settings for more optimal effect.

The results of this study should be considered in the context of the limitations and should not be generalized beyond the parameters of the study. First, the smoking outcomes used in the study relied on preadolescent self-report and were not biochemically validated. In addition, the samples recruited were relatively small and the school sample was comprised of a limited number of schools from a single geographic area. Although we had planned to include a measure of socioeconomic status (SES) in our questionnaire, young children in the school sample could not reliably provide the necessary information to determine SES, such that only an indirect estimate of SES was obtained based on the median income for each school's zip code. Although the comparison schools were selected due to their demographic similarities to the cancer sample, differences in age, gender and race were obtained between the two groups, likely due to sampling variability; after employing matched sampling in our analyses, these demographic differences were attenuated. Lastly, despite our careful attention to the literature and the available measures for the risk factors being assessed, some of the outcomes were brief single item measures or scales which had not previously been used with preadolescent samples which provided less than optimal levels of internal reliability in some cases. Future refinement of these measures is necessary to better define the relationship between smoking behaviors and various risk factors.

The lack of reported smoking among preadolescents with cancer should not be interpreted to mean that smoking among pediatric cancer patients is not problematic. Nor should the finding

that pediatric cancer patients are less likely to intend to smoke in the future suggest that pediatric cancer patients be less likely to smoke later in life. In fact, available evidence suggests that young cancer survivors smoke at significant rates in young adulthood [10]. Rather, the implications of these findings for tobacco control among young cancer patients in active treatment are quite significant. Research has found that youngsters who initiate smoking prior to participation in middle-school prevention programs have been found to be unaffected by such programs [49-52]. As a result, efforts to begin smoking prevention should begin during the elementary years, a time prior to smoking initiation and the development of solidified smoking attitudes. The treatment for cancer may provide an excellent opportunity for health care providers to begin to communicate anti-smoking messages to their young patients. In addition to anti-smoking educational initiatives, education about magnified tobacco-related health risks may further reduce the likelihood that pediatric cancer patients will initiate smoking.

Clinical practice guidelines suggest that at every health care visit, all children should be asked about tobacco use and their intentions to smoke in the future, advised to stop smoking or continue to abstain from smoking, assessed for their willingness to stop smoking, assisted with smoking cessation and provided with a follow-up [53]. These strategies should similarly address parental and peer smoking behaviors. In the absence of other evidence, the results of this study also suggest that smoking prevention programs built on traditional tobacco-specific and general psychosocial risk factors for healthy preadolescents, may be similarly applicable to the young patient treated for cancer. However, revisions to the content and delivery and reliance on the supportive and motivational aspects of the treatment setting may be necessary to enhance the impact of more traditional approaches implemented with young cancer patients.

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Table I

Comparison of Demographic and Psychosocial Characteristics of Nonsmoking Preadolescents With and Without Cancer

Characteristic	Cancer n=94[1]	School n=190[1]	P-Value[2]
Demographics			
Age – M (SD)	9.3 (1.2)	9.5 (0.9)	0.072
Gender – n (%)			
Male	56 (59.6)	111 (58.4)	0.853
Female	38 (40.4)	79 (41.6)	
Race/Ethnicity – n (%)			
White	66 (70.2)	142 (74.7)	0.103
African-American	23 (24.5)	27 (14.2)	
Hispanic	3 (3.2)	10 (5.3)	
Asian	0 (0.0)	6 (3.2)	
Other	2 (2.1)	5 (2.6)	
Tobacco Variables			
Intentions – n (%)			
Some	13 (14.0)	63 (34.1)	<0.001
None	80 (86.0)	122 (66.0)	
Smoking Status – n (%)			
Never Smoked	91 (97.9)	176 (95.1)	0.346
Past Smoker	2 (2.2)	9 (4.9)	
Parent(s) Smokes – n (%)			
Yes	38 (40.9)	62 (33.9)	0.447
No	53 (57.0)	119 (65.0)	
Don't Know	2 (2.2)	2 (1.1)	
Close Friends Smoke – n (%)			
1 or more	7 (7.5)	32 (16.8)	0.030
0	87 (92.6)	158 (83.2)	
Instrumental Value – M (SD)	2.7 (4.8)	3.5 (4.7)	0.002
Tobacco Knowledge – M (SD)	48.6 (4.0)	46.7 (5.2)	0.001
Perceived Vulnerability: Tobacco-related Illnesses – M (SD)	21.6 (3.0)	20.1 (3.6)	<0.001
Total Smoking Messages – M (SD)	6.1 (1.7)	6.4 (1.8)	0.059
General Psychosocial Variables			
Total Optimism – M (SD)	29.4 (4.8)	25.7 (6.2)	<0.001
Rebelliousness – M (SD)	0.6 (1.2)	1.1 (1.6)	0.001
Health Value – M (SD)	3.7 (0.8)	3.3 (1.1)	0.001
Perceived Vulnerability: General Health – M (SD)	2.1 (1.5)	1.3 (1.4)	<0.001

[1] Six participants were missing data for Intentions, Smoking Status, Health Value, and Perceived Vulnerability: General Health; eight were missing data for Parent Smoking; five were missing data for Perceived Vulnerability: Tobacco-Related Illnesses; seven were missing data for Total Smoking Messages and Optimism.

[2] Mantel-Haenszel chi-square test for ordinal data (Age, Health Value, Perceived Vulnerability: General Health), chi-square test or exact chi-square test for categorical data, and Wilcoxon rank sum test for continuous data.

Table II

Logistic regression analyses with tobacco-related (proximal) predictors of intentions to smoke in nonsmoking preadolescents (n=260*, R^2=0.32)

Variable	Odds Ratio	95% Confidence Interval	P-Value
Age (in years)			
Increasing	1.58	1.12 – 2.25	0.010
Gender			
Male vs. Female	2.13	1.08 – 4.21	0.030
Race			
White vs. Non-White	1.76	0.83 – 3.75	0.141
Group			
Cancer vs. School	0.44	0.20 – 0.95	0.038
Parent Smokes			
Yes/DK vs. No	2.12	1.12 – 4.02	0.021
Close Friend(s) Smoke			
1 or more vs. 0	5.05	2.18 – 11.69	<0.001
Tobacco Knowledge			
Decreasing	0.95	0.88 – 1.02	0.163
Instrumental Value			
Increasing	1.06	0.99 – 1.14	0.089
Perceived Vulnerability for Tobacco-Related Illnesses			
Decreasing	1.15	1.05 – 1.26	0.003

* Six participants were missing intentions scores and 18 were missing values for independent variables, so 260 participants contributed to this model.

Table III

Logistic regression model with distal predictors of intentions to smoke in nonsmoking adolescents (n=260, R^2=0.20)

Variable	Odds Ratio	95% Confidence Interval	P-Value*
Age (in years)			
Increasing	1.44	1.06 – 1.98	0.022
Gender			
Male vs. Female	1.52	0.82 – 2.82	0.185
Race			
White vs. Non-White	1.85	0.91 – 3.80	0.091
Group			
Cancer vs. School	0.43	0.21 – 0.89	0.023
Total Optimism			
Decreasing	1.04	0.99 – 1.09	0.116
Rebelliousness			
Increasing	1.36	1.12 – 1.66	0.002

*Six participants were missing intentions scores and 18 were missing values for independent variables, so 260 participants contributed to this model.