Health-Compromising Behaviors: Why Do Adolescents Smoke or Drink?

Identifying Underlying Risk and Protective Factors

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Objectives: To better understand the motivation for adolescent smoking and drinking and to identify the underlying risk and protective factors associated with these behaviors among adolescents.

Design: Cross-sectional, school-based survey of students in grades 5 through 12.


Main Outcome Measures: Sex-specific adjusted relative risks (RRs) and 95% confidence intervals (CIs) comparing self-reported regular smokers and regular drinkers by risk and protective factors with adolescents reporting none of these behaviors.

Results: Adolescent boys and girls were equally likely to be regular smokers (11.2%). The prevalence rate of regular drinking was only slightly higher for boys (22.4%) than it was for girls (19.3%). The rates of both health-risk behaviors were significantly higher for those reporting risk factors, and the strengths of associations varied by sex. Sex differences also emerged in motivation for engaging in these behaviors. When we adjusted for demographic characteristics, exposure to childhood abuse (RR, 4.1; 95% CI, 2.4-7.0) and stressful life events (RR, 3.1; 95% CI, 1.8-5.6) were significantly associated with increased risk for regular smoking. Similar associations were again found for regular drinking. Parental support was protective against both health-risk behaviors for both sexes. Participation in extracurricular activities was associated with lower risk for regular smoking for boys (RR, 0.4; 95% CI, 0.2-0.7) and for girls (RR, 0.3; 95% CI, 0.2-0.5); however, there was no significant association between drinking behavior and participation in activities.

Conclusions: The increased risk for regular smoking and regular drinking among adolescents with a history of abuse, family violence, depressive symptoms, and stressful life events suggests that routine screening for abuse, violence, and other family experiences should be an essential component of adolescent health care visits. Effective prevention programs to reduce smoking and drinking among adolescents should recognize that health-risk behaviors may be associated with other negative life experiences and that the strength of these associations differs by sex.


Health-risk behaviors, especially smoking and drinking, remain a major problem among US adolescents. These behaviors are associated with the leading causes of mortality and morbidity, posing immediate risks to health during adolescence and increasing the likelihood of excess preventable morbidity and death in adulthood.1-3

Alcohol continues to be the most common substance of abuse among US adolescents.7 Nearly 80% of high school students report having used alcohol at some time in their lives.3 Recent statistics show that 62.3% of 12th graders, 48.9% of 10th graders, and 24.8% of 8th graders reported that they had been drunk at least once in 1999.6 Binge drinking (consuming ≥5 drinks in succession on one occasion) is alarmingly common, with 31% of seniors, 26% of sophomores, and 15% of 8th graders having done so within the previous 2 weeks.6 Initial use of alcohol often occurs in early adolescence. Studies that focus on youth reveal that 39% of 6th to 8th graders consumed alcohol at least...
once in the past year. Use of alcohol is associated with the major causes of death in adolescents and young adults, including unintentional injury, suicide, and homicide. Furthermore, adolescents who drink become addicted to alcohol more rapidly than do adults who drink, especially when drinking begins before age 15.10

Despite the well-known adverse effects of smoking on health,11-13 rates of current smoking among adolescents remain at unacceptably high levels, with initiation of smoking occurring at progressively younger ages. More than one third (34.6%) of seniors, 25.6% of sophomores, and 17.5% of 8th graders report smoking 1 or more cigarettes in the last 30 days.14 The onset of tobacco addiction occurs primarily among children, at an average age of 12.11 Most adolescent smokers are addicted to nicotine and report that they want to quit but are unable to do so.15

Significantly, the rates of smoking and drinking have remained at high levels even though major intervention
programs to prevent youth from initiating these behaviors have been developed. Recently, a large body of research has focused on identifying factors that heighten or decrease the risk for engaging in health-compromising behaviors.\textsuperscript{16-19} Cumulative findings have distinguished lower socioeconomic status, \textsuperscript{20-22} psychological distress, \textsuperscript{23-25} exposure to violence and abuse, \textsuperscript{26-30} and family stressors\textsuperscript{31,32} as putting adolescents at greater risk of regular smoking or regular alcohol use. More recently, research efforts have also begun to explore the impact of protective influences on the probability of adolescents' engaging in risky behaviors.\textsuperscript{33-35}

In the present study, we examine the relationships between rates of smoking and drinking and a wide range of life experiences, abuse, violence, negative life events, and depressive symptoms, using a large nationally representative sample of adolescents and spanning an important age range. Our analysis examines the effects of

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exposure to factors thought to increase the risk of smoking and drinking. We also examine factors believed to attenuate or protect against health-risk behaviors. In addition, our analysis explores whether the associations of smoking and drinking with risk and protective factors differ by sex.

### DEMOGRAPHICS

The sample was approximately evenly divided between boys and girls, and nearly 60% of respondents were white (Table 1). The sample was also similarly distributed across grade levels. More than one third (39.9%) of adolescents had at least 1 parent with a college or higher education. About two thirds (65.4%) of adolescents lived in households with 2 parents.

Table 1 also presents weighted percentages of adolescents reporting smoking and drinking for the entire sample and by sex. Overall, 11.2% of adolescents reported regular smoking, 20.9% reported regular drinking, and 19.2% reported using drugs in the preceding month. The prevalence of these behaviors was similar for both sexes. Notable sex differences emerged for risk and protective factors. Overall, 17.7% of adolescents reported being physically or sexually abused. Girls were significantly more likely than were boys to report a history of abuse. Girls were also more likely to say that violence made them want to leave home and were more likely to report moderate to high depressive symptoms. Girls were more likely than were boys to have had parental support, as measured by their discussing health issues with them and considering parents as support persons when they were in need, but both sexes were equally likely to participate in extracurricular activities.

### PREVALENCE OF REGULAR SMOKING AND DRINKING

The prevalence of regular smoking and regular drinking differed significantly by grade level (Table 2). Adolescents in grades 11 and 12 were 3 times as likely as those in grades 7 and 8 to smoke regularly and nearly 4 times as likely to drink regularly. Adolescents in grades 11 and 12 were also twice as likely as the younger group (25.3% vs 12.7%; P < .01) to report the use of drugs. The rates of both behaviors were highest among white adolescents, adolescents whose parents had less than a high school education, and those who lived with 1 parent or in a non-traditional living arrangement. Notably, rates of regular smoking and drinking were significantly lower for blacks than they were for white or Hispanic adolescents.

The reported rates of regular smoking and regular drinking were significantly higher for adolescents who reported a history of abuse, family violence, negative life events, or high depressive symptoms (Table 3). Adolescents with a history of physical or sexual abuse were nearly 3 times as likely to report regular smoking and nearly twice as likely to report regular drinking as their nonabused peers. These differences in rates of regular smoking and regular drinking were marked across all risk factors, and the strengths of associations varied by sex. More extreme use of alcohol by boys who reported physical or sexual abuse was also evident (data not shown).

Boys with a reported history of abuse were more than twice as likely to report regular smoking, 20.9% reported regular drinking, and 19.2% reported using drugs in the preceding month. The prevalence of these behaviors was similar for both sexes. Notable sex differences emerged for risk and protective factors. Overall, 17.7% of adolescents reported being physically or sexually abused. Girls were significantly more likely than were boys to report a history of abuse. Girls were also more likely to say that violence made them want to leave home and were more likely to report moderate to high depressive symptoms. Girls were more likely than were boys to have had parental support, as measured by their discussing health issues with them and considering parents as support persons when they were in need, but both sexes were equally likely to participate in extracurricular activities.
as likely as girls who reported abuse to consume 6 or more drinks in succession (34.2% vs 14.7%; \(P , .01\)) and nearly twice as likely to get drunk every time they drink (37.1% vs 19.9%; \(P , .01\)).

Adolescents who had parental support or participated in extracurricular activities had significantly lower prevalences of regular smoking and regular drinking than did adolescents without these protective factors.

WHY GIRLS AND BOYS SAY THEY DRINK OR SMOKE

Although a common reason for smoking given by boys (50.1%) and girls (56.4%) was that they smoke because they are surrounded by others who smoke, there were significant sex differences on reported rates of other reasons why they smoke (Table 4). Among regular smokers, adolescent girls were much more likely than were adolescent boys to say they smoke to relieve stress and to help them stay slim. Boys were more likely than were girls to say that smoking makes them feel “cool.”

Nevertheless, the 3 primary reasons for regular drinking were similar for boys and girls. Most said they drink because drinking is fun, because it helps them relieve stress, and because it helps them forget their problems. As with smoking, some sex differences in reported rates were evident. Girls were more likely than were boys to say they drink to relieve stress and to forget their problems. In contrast, boys were more likely than were girls to say that they drink because all the popular kids drink.

MULTIVARIATE ANALYSIS

Relationships between risk and protective factors and regular smoking and drinking were examined further, controlling for grade level, ethnicity, parents’ education, and family structure (Table 5). For boys, a history of abuse was associated with a 4-fold higher risk for regular smoking (RR, 4.1) and a 2-fold higher risk for drinking (RR, 2.2). Experiencing negative life events was most strongly associated with drinking behavior (RR, 4.8) and with a more than 2-fold higher risk for smoking (RR, 2.4). The associations of other risk factors with either behavior were not significant.

For girls, significant associations were found between each of the risk factors and health-risk behaviors, with adjusted RRs ranging from 1.5 to 3.1 for regular smoking and from 1.4 to 2.0 for regular drinking.

Of the protective factors, parental support remained significant after controlling for demographic characteristics and diminished by one half the risk for regular smoking and drinking among boys and girls. Participation in extracurricular activities also had a protective effect on smoking, with RRs ranging from 0.3 for girls to 0.4 for boys. However, the association of extracurricular activities with drinking behavior was not significant.

Adolescents who report physical or sexual abuse, violence within the family, stressful life events, or moderate to high depressive symptoms are more likely to report regular smoking and regular drinking. The strength of these associations varies across behaviors and by sex. Consistent with previous findings, depression was a significant risk factor for girls’ smoking and drinking, but depressive symptoms were not significant for boys when other characteristics were controlled for in the model. For girls, experiencing even 1 or 2 stressful events was significantly associated with increased risk of regu-
from earlier studies, more extreme use of alcohol boys' smoking and drinking. Consistent with findings sexes—abuse was an especially strong risk factor for abused and current smoking and drinking for both strong association between reports of ever being experienced abuse—and there was a result of the different socialization of boys and girls,ences may be due to sex differences in coping styles. As Previous studies have shown that girls often rate negative symptoms relative to boys.50,51

In this analysis, protective factors were conceptualized as distinct from risk factors. Parental support as a protective factor encompassed several dimensions, including emotional support, closeness, and communication. Strong parental support was significantly associated with reduced risks of smoking and drinking for both sexes, and these protective factors had an independent contribution when controlling for all other characteristics. Studies that have measured other dimensions of family environment have found similar results. Adolescents who reported a “connectedness” to their parents were the least likely to engage in risky behaviors. These adolescents felt close to their parents, believed their parents and family members cared for them, and were satisfied with their family relationships. In addition, other investigators have found that perceived high expectations by parents regarding school achievement and a sense of parental connection to the school also protected young people from a variety of risk behaviors.

The second protective factor, participation in extracurricular activities such as exercise or after-school sports clubs, was also associated with a decreased risk of smoking for boys and girls, but had no impact on the risk of drinking. Lower smoking rates among those involved in extracurricular activities could indicate that participation provides a protective factor, or it might be that adolescents who joined exercise or after-school sports clubs may have chosen a healthier way of life. The cross-sectional nature of the study does not allow us to infer causality. Notably, the study did not find a similar extracurricular-activity protective impact on alcohol use.

### Table 3. Prevalence of Regular Smoking and Drinking by Risk and Protective Factors Among Adolescents in Grades 7 Through 12

<table>
<thead>
<tr>
<th>Factor</th>
<th>Total Regular Smoker</th>
<th>Total Regular Drinker</th>
<th>Boys Regular Smoker</th>
<th>Boys Regular Drinker</th>
<th>Girls Regular Smoker</th>
<th>Girls Regular Drinker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical or sexual abuse</td>
<td>Yes</td>
<td>22.6†</td>
<td>33.5†</td>
<td>25.1†</td>
<td>36.8†</td>
<td>20.9†</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>8.1</td>
<td>17.9</td>
<td>7.9</td>
<td>19.4</td>
<td>8.3</td>
</tr>
<tr>
<td>Family violence, wants to leave home</td>
<td>Yes</td>
<td>18.6†</td>
<td>29.2†</td>
<td>17.9†</td>
<td>31.1†</td>
<td>19.1†</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>8.2</td>
<td>18.7</td>
<td>8.6</td>
<td>19.8</td>
<td>7.8</td>
</tr>
<tr>
<td>Negative life events, 3-4</td>
<td>Yes</td>
<td>23.8†</td>
<td>39.7†</td>
<td>20.2†</td>
<td>46.3†</td>
<td>28.1†</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>9.3</td>
<td>18.5</td>
<td>10.3</td>
<td>20.1</td>
<td>8.2</td>
</tr>
<tr>
<td>Moderate/high depressive symptoms</td>
<td>Yes</td>
<td>20.0†</td>
<td>31.9†</td>
<td>21.1†</td>
<td>32.7†</td>
<td>19.3†</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>9.2</td>
<td>18.4</td>
<td>9.7</td>
<td>20.6</td>
<td>8.5</td>
</tr>
<tr>
<td>Protective factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental support and communication</td>
<td>Yes</td>
<td>6.7†</td>
<td>15.3†</td>
<td>5.2†</td>
<td>15.2†</td>
<td>7.8†</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>13.1</td>
<td>23.3</td>
<td>13.5</td>
<td>24.8</td>
<td>12.7</td>
</tr>
<tr>
<td>Participates in extracurricular activities</td>
<td>Yes</td>
<td>10.1†</td>
<td>20.2</td>
<td>10.3†</td>
<td>21.8</td>
<td>9.8†</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>30.0</td>
<td>31.6</td>
<td>32.5</td>
<td>33.1</td>
<td>27.8</td>
</tr>
</tbody>
</table>

*Data are from the Commonwealth Fund Survey. Data are given as percentage (weighted). Comparisons are paired t tests among the groups with and without risk or protective factors for regular smoking and regular drinking by sex. The reference categories are neither abuse, did not want to leave home because of family violence, no negative life events, no parental support, and no participation in extracurricular activities.

†P<.01.
Table 4. Reasons for Smoking and Drinking, by Sex Among Adolescents in Grades 7 Through 12*

<table>
<thead>
<tr>
<th>Selected Answers to the Question “Why Do You Smoke?”</th>
<th>Regular Smoker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Girls (n = 333)</td>
</tr>
<tr>
<td>Cigarettes help me relieve stress</td>
<td>70.4††</td>
</tr>
<tr>
<td>I am around people who smoke all the time</td>
<td>56.4</td>
</tr>
<tr>
<td>It helps me be thin</td>
<td>16.2‡</td>
</tr>
<tr>
<td>Wanted to try, experiment</td>
<td>15.2</td>
</tr>
<tr>
<td>My friends encouraged me to smoke</td>
<td>13.3</td>
</tr>
<tr>
<td>Smoke to be “cool”</td>
<td>3.7†</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Selected Answers to the Question “Why Do You Drink?”</th>
<th>Regular Drinker</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Girls (n = 545)</td>
</tr>
<tr>
<td>Drinking is fun</td>
<td>66.4</td>
</tr>
<tr>
<td>Drinking helps me relieve stress</td>
<td>34.9†</td>
</tr>
<tr>
<td>It helps me forget problems</td>
<td>34.1†</td>
</tr>
<tr>
<td>I am around people who drink all the time</td>
<td>27.1</td>
</tr>
<tr>
<td>Friends encouraged me to drink</td>
<td>11.9</td>
</tr>
<tr>
<td>All the popular kids drink</td>
<td>2.4†</td>
</tr>
</tbody>
</table>

* Data are from the Commonwealth Fund Survey.36,37 Data are given as percentage (weighted). Sample size (n) is unweighted. †P < .01.

STRENGTHS AND LIMITATIONS

This study had a number of strengths that increase the applicability of the data to the larger population of youth. First, the survey used in the present study included a wide range of risk indexes. Second, the study directly examined the independent and collective effect of risk factors as well as influences of protective factors that mitigate the exposure to risk. In addition, by using the multinominal model, we were able to focus on adolescents who were regular smokers and regular drinkers, the group at highest risk for becoming addicted to nicotine and alcohol as adults.56 Finally, a major strength of the study was the use of a large nationally representative sample of adolescents, thus allowing for the generalization of findings to other youths in the United States. Our findings provide a greater understanding of the contributing factors and adolescent motivation for smoking and drinking and are especially pertinent to clinicians and other professionals providing health care to youth.

Nevertheless, in drawing conclusions from this study, one must consider its limitations. First, the data are cross-sectional; thus, our observations are associations and do not provide information about causal direction. Cross-sectional studies can rule out possible causes when relationships between variables are not found. They do not, however, determine with certainty which came first, smoking or the variable correlated with it. Second, the data apply only to adolescents who attend school. Absentees and dropouts, presumably at higher risk, were not included. Moreover, while a number of steps were taken to maximize participation, the actual response rates for eligible sampled youth could not be determined. The specific grade was selected randomly in each school, without detailed information about the size of any individual class. Although all students were instructed to return the completed questionnaires in sealed envelopes, we have no information on how many students were absent on the day of the survey. Based on the comparisons of survey responses with those of other national studies of adolescent health, we believe, however, that the final sample is nationally representative of the target adolescent, in-school population.

As with all self-reported data, the question of validity is of concern; this is particularly the case when sensitive questions about abuse and substance use are asked. Although the accuracy of self-reported information on physical and sexual abuse is not clearly documented,37 efforts were taken to ensure confidentiality and anonymity of responses. Furthermore, other stud-
ies indicate that self-report data of health behaviors are generally reliable.38

IMPLICATIONS FOR HEALTH CARE PROVIDERS

Our findings have important implications for professionals providing health care. The strong associations between negative life experiences and depressive symptoms with regular smoking and regular drinking indicate the need for increased awareness among providers of the possible links between health and underlying concerns and behaviors. In addition to standard questions about drinking and smoking, professionals providing health care need to elicit information from adolescents about stressful life events and find productive ways such as outreach and counseling to help adolescents to cope. One way is to increase social support and provide community resources where they can turn for help.

The significant rates of drinking and smoking among adolescents who have reported physical or sexual abuse confirm the importance of screening for abuse during adolescent health care visits, as has been recommended in the American Medical Association’s Guidelines for Adolescent Preventive Services.39 A reported history of physical or sexual abuse should alert professionals providing health care to the possible occurrence of other risky behaviors, and, conversely, certain adolescent problem behaviors should alert the clinician to question adolescents more closely about physical or sexual abuse.

Effective prevention efforts should also recognize that the motivation for engaging in risky behavior differs between boys and girls. Adolescent girls may believe that smoking keeps their weight down, as has been shown prospectively in earlier studies.60-62 These views should prompt clinicians to suggest healthier and more effective methods of weight control for teenage girls as a part of routine smoking intervention programs.

The sex differences found in associations between risk factors and rates of regular smoking and drinking also have implications for clinicians working with adolescents. Programs to target depression that include alternative coping mechanisms and social support may be effective in smoking and alcohol prevention for girls. In contrast, intensive programs targeted at adolescents exposed to multiple life events may be more effective in combating problem drinking for adolescent males.

Parental support and school activities were associated with lower rates of risk behaviors. For adolescents without strong connections to supportive parents, the findings suggest the need for providing them with other access to caring adults for social and emotional support. The importance of mentoring relationships for at-risk youth has been lately rediscovered.63 Adolescents should also be encouraged to participate in sports and after-school activities, and schools need to create opportunities for students to learn healthy behaviors.

Considering these associations, a review of family structure, school, abuse history, and other life experiences remains an important aspect of routine health maintenance for adolescents. Further study is needed to identify causal relationships between programs and activities and long-term health or school outcomes.

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REFERENCES