Exposure to the World Trade Center Attack and the Use of Cigarettes and Alcohol Among New York City Public High-School Students

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We examined exposure to the World Trade Center attack and changes in cigarette smoking and drinking among 2731 New York City public high-school students evaluated 6 months after the attack. Increased drinking was associated with direct exposure to the World Trade Center attack (P<.05). Increased smoking was not directly associated with exposure to the World Trade Center attack but was marginally significantly associated with posttraumatic stress disorder (P=.06). Our findings suggest that targeted substance-use interventions for youths may be warranted after large-scale disasters. (Am J Public Health. 2006;96:804-807. doi: 10.2105/AJPH.2004.058925)

Millions of Americans, especially those living in New York City, were affected, many of them traumatically, by the World Trade Center (WTC) attack on September 11, 2001. Studies of adults have documented elevated rates of posttraumatic stress disorder (PTSD),1 psychological stress,2,3 and substance use immediately after the attack.4-6 The immediate effect on children and adolescents of the WTC attack was not assessed as intensively as it was on adults.7-9 Studies have shown increases in substance use in relation to exposure to trauma and PTSD, suggesting that substance use may develop as one attempts to relieve traumatic memories, sleep disturbances, and other PTSD symptoms.10-13 To our knowledge, no studies have been published assessing exposure to the WTC attack and changes in cigarette smoking and alcohol use among adolescents. We sought to understand (1) how different types of exposure to the WTC attack contributed to an increase in smoking and/or drinking among New York City adolescents, and (2) whether PTSD related to the WTC attack can explain increases in use of cigarettes and alcohol among New York City adolescents.

METHODS

Our analyses were based on self-reported14 data from 2731 high-school students who participated in a New York City Board of Education-sponsored post–September 11 needs assessment and were asked about smoking and drinking after September 11, 2001 (response rate=79%). Details of the study’s methodology and a description of the total sample (N=8236) of students in grades 4 to 12 are given elsewhere.15,16 Participation was anonymous with parental notification. The study was carried out in full compliance with institutional review board requirements.

The survey was conducted 6 months after the WTC attack. Adolescents were asked questions about changes in smoking and drinking after September 11. Adolescents who reported that they “started to smoke cigarettes” or “smoked more cigarettes” after September 2001 were considered to have increased smoking. Adolescents who reported that they “drank more alcohol” after September 2001 were considered to have increased alcohol consumption.

We collected information on different types of exposure to the WTC attack: (1) direct exposure, (2) family exposure, (3) media exposure, and (4) attendance at a school in the Ground Zero area. We also obtained information about previous exposure to traumatic situations, such as having had a severe injury in violent circumstances or having lived through war or another pre–September 11, 2001, disaster. Detailed definitions of these exposure categories can be found elsewhere.9

We assessed PTSD related to the WTC attack using the Diagnostic Interview Schedule...
for Children Predictive Scales. We considered a student to have probable PTSD if he or she had positive screening results for 5 of 8 PTSD symptoms and reported significant impairment. Sociodemographic information also was obtained.

Initially, we examined bivariate associations between 2 dichotomous outcome variables (increased smoking and increased drinking) and independent variables of interest. We used logistic regression analysis to assess the association between an outcome variable and each independent variable, after we adjusted for other risk factors. We used SUDAAN software (Research Triangle Institute, Research Triangle Park, NC) to account for the complex sampling design and to obtain correct variance estimates.

RESULTS

Table 1 shows that 5.4% of the students reported increased cigarette use or having started smoking after the WTC attack, and 10.9% reported increased drinking. Among all types of exposure, only direct exposure was significantly associated with increased drinking (odds ratio [OR]=1.8; P<.05). Increased smoking was significantly associated with prior trauma (OR=2.0; P<.05) and PTSD (OR=3.1; P<.05). Older age was associated with increased drinking (OR=1.5; P<.05) but not smoking. Non-White students, especially Black and Hispanic students, were less likely to report increased smoking or drinking than were non-Hispanic White students.

Table 2 shows the results from the logistic regression analyses when all factors were considered simultaneously. Most associations that were significant in bivariate analyses remained significant in the multiple logistic regression analyses. However, the adjusted odds ratio for the association between increased smoking and PTSD decreased to 2.5 (P=.06).

DISCUSSION

As in studies of adults, our study identified an association between exposure to the events of September 11, 2001, and alcohol use in adolescents. Different factors were associated with increases in cigarette smoking and alcohol consumption after September 11, 2001, suggesting distinct underlying mechanisms. We found a significant association between direct exposure to the WTC attack and increased alcohol consumption, which suggests that alcohol was used as a way of coping with the immediate effect of the attack. We found a marginally significant association between PTSD and cigarette smoking and no
TABLE 2—Increased Smoking and Drinking Among 2731 New York City Public High-School Students, by Demographics, Exposure to the World Trade Center Attack, and Probable Posttraumatic Stress Disorder (PTSD): Results of Multiple Logistic Regression Analyses

<table>
<thead>
<tr>
<th>Sociodemographics</th>
<th>Increased Smoking</th>
<th>Increased Alcohol Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adjusted OR (95% CI)</td>
<td>Adjusted OR (95% CI)</td>
</tr>
<tr>
<td>Girl</td>
<td>1.1 (0.7, 1.9)</td>
<td>1.1 (0.8, 1.5)</td>
</tr>
<tr>
<td>Age ≥ 17 y</td>
<td>1.3 (0.6, 2.2)</td>
<td>1.5* (1.0, 2.1)</td>
</tr>
<tr>
<td>Race/Ethnicity (reference group = White)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other/Mixed</td>
<td>0.5** (0.1, 0.6)</td>
<td>0.4** (0.2, 0.7)</td>
</tr>
<tr>
<td>Asian</td>
<td>0.4 (0.2, 0.7)</td>
<td>0.5* (0.3, 0.9)</td>
</tr>
<tr>
<td>Low maternal education</td>
<td>1.1 (0.7, 1.9)</td>
<td>0.9 (0.5, 1.5)</td>
</tr>
<tr>
<td>Not living with both biological parents</td>
<td>1.2 (0.7, 1.9)</td>
<td>1.1 (0.7, 1.6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct</td>
<td>1.0 (0.5, 1.9)</td>
<td>1.8* (1.1, 2.9)</td>
</tr>
<tr>
<td>Family</td>
<td>1.1 (0.6, 2.3)</td>
<td>1.1 (0.5, 2.0)</td>
</tr>
<tr>
<td>Media</td>
<td>1.0 (0.6, 1.6)</td>
<td>1.0 (0.5, 1.6)</td>
</tr>
<tr>
<td>Ground zero</td>
<td>1.0 (0.6, 1.8)</td>
<td>0.8 (0.5, 1.3)</td>
</tr>
<tr>
<td>Previous trauma</td>
<td>2.0* (1.1, 3.6)</td>
<td>1.4 (0.3, 2.3)</td>
</tr>
<tr>
<td>Psychiatric disorder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probable PTSD</td>
<td>2.5*** (1.0, 6.6)</td>
<td>1.0 (0.5, 2.1)</td>
</tr>
</tbody>
</table>

Note. OR = odds ratio; CI = confidence interval. *P<.05; **P<.01; ***P=.06.

Our study was limited by its cross-sectional design, retrospective survey method, and lack of detailed information on changes in smoking and drinking behaviors, which may have affected the interpretation of the findings. However, these findings have important clinical and policy relevance, especially in preparation for other possible large-scale traumatic events. Appropriate and targeted prevention and intervention programs are needed to help youths better respond to such crises.

Human Participant Protection

The study was approved by the institutional review board of the New York State Psychiatric Institute.

References


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**Barriers to Participation in the Food Stamp Program Among Food Pantry Clients in Los Angeles**

**Susan J. Algert, PhD, RD, Michael Reibel, PhD, and Marian J. Renvall, MS, RD**

**Substantial numbers of food pantry clients are eligible for food stamps but do not receive them. Background characteristics of 14317 food pantry users in Los Angeles were analyzed to provide information helpful in food stamp outreach programs. Ninety percent of food pantry users were living well below poverty level, 59% were Hispanic, and 44% were homeless. Only 15% of the food pantry clients received food stamps, with homelessness and limited English language skills acting as barriers to food stamp program participation.** (\textit{Am J Public Health.} 2006;96:807–809. doi: 10.2105/AJPH.2005.066977)

Individuals are considered to be food insecure when they are unable to obtain the quantity and quality of food needed for basic health and well-being. Food pantries are a type of private emergency food assistance service that provides low-income households with packages of food items usually requiring additional preparation. Food pantry users represent a group at highest risk for being food insecure who can benefit from participation in the USDA's food stamp program. The majority of food pantry clients are eligible to receive food stamps because of low income, but a substantial number do not receive them.

In 2001, 1.46 million adults in California experienced food insecurity and had incomes below 130% of the federal poverty level, yet 1.21 million were not getting food stamps. In both California and Los Angeles County, more recent statistics indicate that about half of the eligible participants do not receive food stamps. Barriers to food stamp participation in California and Los Angeles include a finger imaging requirement, a lengthy and complex application process, and lack of knowledge about eligibility. Nationally, changing eligibility restrictions and the stigma associated with participation also act as barriers to increasing food stamp enrollment.

This research project compares sociodemographic characteristics of food pantry clients who are food stamp recipients versus nonrecipients to provide information helpful in improving food stamp outreach and enrollment.

**METHODS**

Data were collected on 14,317 clients attending 2 different food pantries in Pomona and Ontario (inland cities in the greater Los Angeles area) during 2003. Bilingual food pantry workers interviewed clients to gather information on eligibility for emergency food assistance, and the data were later entered into the Access software program (Cisco Systems, San Jose, Calif.). Data were pooled, as sociodemographic profiles were similar for both communities, with a greater proportion of Hispanics (65% for Pomona and 60% for Ontario) and a higher percentage having less than a high school education (45% for Pomona and 38% for Ontario) than Los Angeles County.

The number of people living in poverty was higher than the national average (12%) for residents in Pomona (22%), Ontario (16%), and Los Angeles (18%). Food stamp participation in the sample population was measured by self-reported food stamp income.

Income, housing, ethnic background, and homelessness were the sociodemographic characteristics analyzed for frequency in the sample population. The following hypotheses were tested by regressing the binary outcome "food stamp participation" on food pantry client sociodemographic variables: (1) single-parent families with children would be more likely to receive food stamps; (2) English language ability would encourage food stamp program participation; and (3) homeless clients would be less likely to receive food stamps.