Gambling as an Emerging Health Problem on Campus

Wendy L. Stuhldreher, PhD, RD; Thomas J. Stuhldreher, DBA; Kimberly Y-Z Forrest, PhD

Abstract. Objective: The authors documented the prevalence of gambling and correlates to health among undergraduates. Methods: The authors analyzed data from a health-habit questionnaire (gambling questions included) given to students enrolled in a university-required course. Results: Gambling and problems with gambling were more frequent among men than women regardless of venue. Athletes more frequently bet on sports and played games of chance, had gambling debt, and sought help for gambling than did nonathletes. More than 50% of fraternity members gambled and had a higher prevalence of gambling debt than did other men. Several gambling practices were correlated with failure to use seatbelts, driving or riding with someone under the influence, and using drugs (including cigarettes). Twice as many students who had gambling problems reported considering or attempting suicide than did those who did not report gambling problems, and gambling was correlated with depression. Conclusion: These results indicate that gambling is correlated with high-risk health behaviors and indicates the need for intervention for college students with gambling problems.

Keywords: college students, gambling, high-risk behavior

College typically has been a time during which researchers have documented high-risk behaviors, such as binge drinking and unprotected sexual activity. Gambling is an emerging high-risk behavior that has sounded the alarm bell on campuses nationwide. In the past decade, several media reports of the prevalence of gambling on college campuses have surfaced. Reports from universities in Michigan, Florida, South Carolina, Texas, Arkansas, Iowa, Maine, and Rhode Island of student-operated sports-betting networks sparked national concern during the 1990s. Because of these reports, the National Collegiate Athletic Association (NCAA) officials conducted an infractions study in which they concluded that about a quarter of athletes had gambled on college sporting events and that 3.7% betted on a game in which they had actually played. Cross and Vallano then studied 182 NCAA schools and found that 72% of student athletes had gambled while in school, with 35% gambling on sporting events.

However, gambling is not exclusively a problem for college athletes. Officials with the National Association of Student Personnel Administrators (NASPA) have warned that gambling is a concern for all students. NASPA officials have urged college administrators to increase awareness of health risks associated with gambling and address these in programs and prevention efforts.

Gambling is considered problem gambling if a person experiences negative consequences, such as feelings of guilt, inability to control gambling, and time lost from school/work. The standard screening tool for problem gambling is the South Oaks Gambling Screen (SOGS) developed by Lesieur and Blume. A SOGS score of 5 or higher is the standard used to define probable pathological gambler. Pathological gamblers are those with impulse-control disorder, according to the Diagnostic and Statistical Manual of Mental Disorders, fourth edition. Volberg and Steadman have proposed that problem gamblers are individuals with SOGS scores of 3 or 4.

As early as 1987, using the SOGS, Lesieur and Blume surveyed students from the University of Minnesota and found that about 5% of the 384 college students were pathological gamblers. Using data from a meta-analysis, Shaffer, Hall, and Vander Bilt reported that 4.7% of college students met the definition for pathological gambling and that 9.3% met the definition for problem gambling. The prevalence of college gambling was higher than were the prevalence rates for adults (1.6% pathological, 3.8% problem) but more similar to that of adolescents (3.9% pathological, 9.5% problem). Gambling practices differ by gender, with men consistently having higher prevalence rates. Reported findings from both the United States and Canada reveal that men are far more likely than are women to be labeled...
as pathological gamblers (9.3% men vs 2.4% women\textsuperscript{17}; 5.7% men vs 0.6% women).\textsuperscript{19} Likewise, Winters et al\textsuperscript{18} found a gender difference in problem gambling in his study of 2 Minnesota universities (4.9% of men vs 1% of women).

Gambling is truly a high-stakes practice when it comes to health.\textsuperscript{10,15,17,19–21} Researchers in studies of these same behaviors among college students across 5 US states have found that higher SOGS were associated with greater use of tobacco, alcohol, and other drugs.\textsuperscript{17} In their 3-college study of Quebec students, Ladouceur et al\textsuperscript{16} concurred and additionally found higher SOGS associated with overeating. Results from the first national health survey to include gambling questions revealed that student gamblers were more likely to participate in binge drinking and unprotected sex than were other students.\textsuperscript{15}

We will describe the prevalence of gambling among various groups of college students. We will also examine the correlates of gambling with high-risk behaviors among the undergraduate student population of a public university located in a rural setting of Pennsylvania.

**METHODS**

The data for this report originated from an ongoing cross-sectional survey of college student health called the Student Health Assessment Project (SHAP).\textsuperscript{23} Trained student researchers under our supervision administered the survey to all students enrolled in a section of a personal physical fitness course that all undergraduates are required to take. Thus, this class most likely provided a cross-sectional representation of all undergraduates. We obtained permission and support for data collection from each faculty member who taught a section of the course. Data collection occurred during a designated class period (50 minutes) scheduled at the convenience of the instructor. A student researcher introduced the questionnaire and explained that all responses were anonymous. Students did not receive extra credit, and the survey did not affect their grades for the course in any way. We collected the data used for this report in the spring and fall semesters of 2001 and the spring semester of 2002. This was an anonymous survey in which the cover letter described that informed consent was implied by completion of the survey questionnaire. The university’s Institutional Review Board approved our study (#0101-027-41).

The original questionnaire consisted of questions taken from the National College Health Risk Behavior Survey\textsuperscript{24} and The Health Interests and Practices Questionnaire, University of Northern Iowa Health Promotion Division\textsuperscript{25} regarding safety and violence; suicide; tobacco, alcohol, and other drug use; diet; exercise patterns; and sexual behavior. In 2001, we added questions regarding stress and sleeping patterns, and the Beck Depression Inventory,\textsuperscript{26} from which the score would determine the extent of probable depression.

We also added to the survey 6 questions regarding gambling to assess gambling behaviors. Two questions addressed the prevalence of lifetime gambling practices by having respondents indicate: (1) frequency of purchasing lottery tickets and (2) frequency of playing cards or other games of chance for money. The 4 other questions targeted the presence of situations that could indicate that gambling was a problem. Students responded yes or no to the following questions: (1) Have you ever been in debt because of gambling on sports? (2) Have you ever wanted to stop gambling but found you could not? (3) Has anyone ever told you that you need help regarding gambling? and (4) Have you ever sought help for gambling?

To determine the prevalence of gambling debt, we created a variable from the answer to “Have you ever been in debt because of gambling on sports?” If students answered that they had been in debt or were currently in debt, we considered them as ever having gambling debt. If they answered that they gambled on sports but were not in debt or that they did not gamble, we considered them as never having gambling debt. We created another variable to indicate frequent gamblers. We considered any students who reported a frequency ranging from weekly to daily for purchasing lottery tickets or playing games of chance a frequent gambler.

Our goal was to report the prevalence of gambling practices and to determine if gambling is associated with high-risk behaviors. Because we obtained data through a self-administered survey, the analyses are primarily descriptive. We used chi-square analysis to test the association between gambling and various categorical health-related variables using 2 × 2 crosstabs. When the subsample size was large enough to make gender-specific analyses possible, we examined the association between gambling and health-related variable within 2 × 2 tables, separated for men and women. We used SPSS software Version 10.0 (SPSS Inc, Chicago, IL) for the analyses.

**RESULTS**

**Participants**

A total of 1,079 students completed the questionnaire, which represents approximately 16% of the student body. The mean age was 19.9 years (standard deviation [SD] = 1.6), 91% were Caucasian, and more women (58%) than men (42%) responded. As expected from a lower-level course, most students were freshman (36%) and sophomores (34%), 19% were juniors, and 11% were seniors.

**Patterns of Gambling**

**Gender Differences**

The prevalence of all types of gambling (lottery, games of chance, cards and sports betting) was significantly higher among men than among women (see Table 1). The prevalence of frequent gambling (at least weekly) and gambling debt was low; however, there were significant gender differences (frequent gambling: 4% of men vs < 1% of women, \( p < .01 \); gambling debt: 6% of men vs < 1% of women, \( p < .001 \)). Although the frequency of situations that could indicate problem gambling (eg, wanting to stop but unable to,
told to get help, seeking help) was less than 10%, again these patterns were significantly higher for men than for women (see Table 1).

**Patterns Among Athletes**

Because researchers have reported gambling as a problem among athletes, we examined patterns of gambling among students who were athletes and those who were not. About a quarter of the total sample were athletes, with 39% of men and 16% of women members of an athletic team. Significantly more athletes (17%) than nonathletes (9%) reported ever gambling ($p < .01$; see Table 2). Likewise, more athletes reported ever having gambling debt (5%) than did nonathletes (1%; $p < .001$). Among those who reported wanting to stop but could not and reported being told they needed help with gambling, there were no significant differences between athletes and nonathletes. However, a significantly higher percent of athletes sought help for gambling compared with nonathletes (7% vs 4%; $p < .05$). Gender-specific analyses revealed significant differences between gambling practices for athletes and nonathletes only among men. Lack of significant differences in gambling practices between female athletes and nonathletes was caused in part by so few women reporting gambling problems (data not shown).

**Patterns Among Fraternity or Sorority Members**

We also examined the previously described patterns by fraternity/sorority affiliation. Table 3 shows results for fraternity affiliation. Among men, fraternity members had a significantly greater prevalence of playing the lottery, of playing cards/games of chance, and of gambling on sports than did other men. Fraternity members were 4 times more likely than other men to have ever been in debt because of gambling (17% member vs 4% nonmember; $p < .01$) and

### Table 1. Comparison of Prevalence of Gambling Practices, by Gender

<table>
<thead>
<tr>
<th>Gambling practice</th>
<th>Men</th>
<th>Women</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 429)</td>
<td>(n = 611)</td>
<td></td>
</tr>
<tr>
<td>Purchased lottery tickets*</td>
<td>34 144 22 132</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td>Ever played cards or other games of chance*</td>
<td>33 141 11 69</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td>Gambled on sports*</td>
<td>24 101 3 18</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td>Frequent gambler (gamble weekly or more)*</td>
<td>4 16 &lt; 1 5</td>
<td>&lt; .01</td>
<td></td>
</tr>
<tr>
<td>Ever been in debt for gambling*</td>
<td>6 24 &lt; 1 1</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td>Wanted to stop gambling but couldn’t</td>
<td>9 39 5 28</td>
<td>&lt; .01</td>
<td></td>
</tr>
<tr>
<td>Told that you need help with gambling†</td>
<td>9 36 3 18</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td>Sought help for gambling†</td>
<td>6 24 3 20</td>
<td>.07 (NS)</td>
<td></td>
</tr>
</tbody>
</table>

*Not statistically significant.

### Table 2. Comparison of Prevalence of Gambling Practices Between Athletes and Nonathletes

<table>
<thead>
<tr>
<th>Gambling practice</th>
<th>Athlete</th>
<th>Nonathlete</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 272)</td>
<td>(n = 788)</td>
<td></td>
</tr>
<tr>
<td>Purchased lottery tickets</td>
<td>31 81 25 195</td>
<td>.08*</td>
<td></td>
</tr>
<tr>
<td>Ever played cards or other games of chance</td>
<td>25 67 18 142</td>
<td>&lt; .05</td>
<td></td>
</tr>
<tr>
<td>Gambled on sports</td>
<td>17 45 9 73</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td>Frequent gambler (gamble weekly or more)</td>
<td>2 6 2 15</td>
<td>.74*</td>
<td></td>
</tr>
<tr>
<td>Ever been in debt for gambling</td>
<td>5 14 1 11</td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td>Wanted to stop gambling but couldn’t</td>
<td>9 23 6 45</td>
<td>.10*</td>
<td></td>
</tr>
<tr>
<td>Told that you need help with gambling</td>
<td>7 17 5 38</td>
<td>.33*</td>
<td></td>
</tr>
<tr>
<td>Sought help for gambling</td>
<td>7 18 4 27</td>
<td>&lt; .05</td>
<td></td>
</tr>
</tbody>
</table>

*Not statistically significant.

Note. Not every participant answered all the gambling questions.
about 3 times more likely to have been told they needed help regarding their gambling (20% member vs 7% nonmember; \( p < .05 \)). We observed no significant differences between sorority and nonsorority women, in part because of small sample size (data not shown).

### Correlates of Gambling With High-Risk Behaviors

Although the prevalence patterns yielded interesting differences among subgroups of the sample, the statistical power was insufficient to continue subgroup analysis of high-risk behaviors. Thus, we based the next set of results on findings in the total sample.

In addition, it was not possible to discern the temporal sequence (ie, which behavior came first) from these cross-sectional data; however, there were some interesting correlates of gambling and high-risk behaviors. For the correlates of high-risk behaviors and gambling, we examined the difference in the prevalence of these behaviors between those who seemed to have problems with gambling and those who did not. We considered having a problem with gambling as an affirmative response to any of these 4 questions: (1) have you ever been in debt because of gambling on sports; (2) have you ever tried to quit but could not; (3) have you ever been told to get help; and (4) have you ever sought help for gambling. Table 4 lists the significant (minimally \( p < .05 \)) correlates of problem gambling variables and high-risk behaviors (eg, driving and violence; alcohol, tobacco, and other drug use; sexual behaviors).

The prevalence of high-risk driving behaviors (eg, no seatbelt use, driving or riding with someone under the influence of alcohol) was consistently greater among those defined as having a problem with gambling as compared with others. Binge drinking was significantly higher among those with positive responses to the problem gambling questions as compared with others. Problem gamblers were 2 to 4 times more likely to get into fights under the influence of alcohol. Students who had problems with gambling more frequently reported instances of having sex under the influence of alcohol and having sex under the influence of alcohol and regretting it. Those who had gambling debt were twice as likely as others were to smoke. Patterns of drug use were more frequent among those who had gambling debt and were told to get help for gambling. Use of vomiting or laxatives to lose weight was more frequent among those who reported trying to quit gambling but could not, as well as for those told to get help (see Table 4) and those who sought help for gambling (data not shown).

### Correlates of Gambling With Psychosocial Variables

We then examined the associations among problems with gambling and various psychosocial variables. The psychosocial variables included the frequency of having difficulty with relationships, sleep, finances and work, depression (as measured by the Beck Depression Inventory), the frequency of reporting high stress level, and ever considering or attempting suicide. Again, problem gambling variables were the same 4 previously described. Table 5 shows significant associations. Prevalence of depression was almost double for students having problems with gambling. Students reporting problems with gambling had a significantly higher prevalence of both considering and attempting suicide.

Overall, these results support the fact that high-risk behaviors and adverse mental health dispositions cluster with gambling. Use of alcohol and other drugs were related to several behavior patterns that were more frequent among those with gambling problems, again supporting the observation that high-risk behaviors often coexist.

### COMMENT

#### Issues of Study Design and Comparisons

Variations in the prevalence of gambling among college students exist throughout the literature, in part because of the numerous ways in which investigators assessed gambling and in part because of variations in study design.

<table>
<thead>
<tr>
<th>Question</th>
<th>Members (( n = 37 ))</th>
<th>Nonmembers (( n = 407 ))</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchased lottery tickets</td>
<td>57 20</td>
<td>31 123</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Ever played cards or other games of chance</td>
<td>54 19</td>
<td>31 121</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Gambled on sports</td>
<td>46 16</td>
<td>21 84</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Frequent gambler (gamble weekly or more)</td>
<td>9 3</td>
<td>3 13</td>
<td>.13 (NS)*</td>
</tr>
<tr>
<td>Ever in debt for gambling</td>
<td>17 6</td>
<td>4 17</td>
<td>&lt; .01*</td>
</tr>
<tr>
<td>Wanted to stop gambling but couldn’t</td>
<td>14 5</td>
<td>9 34</td>
<td>.21 (NS)*</td>
</tr>
<tr>
<td>Told that you need help with gambling</td>
<td>20 7</td>
<td>7 29</td>
<td>&lt; .05*</td>
</tr>
<tr>
<td>Sought help for gambling</td>
<td>6 2</td>
<td>6 922</td>
<td>.61 (NS)*</td>
</tr>
</tbody>
</table>

Note. Not every participant answered all the gambling questions; NS = not statistically significant.

*Using Fisher’s exact test.

**TABLE 3. Comparison of Men’s Positive Response to Gambling Question, by Fraternity Members and Nonmembers**
Gambling on Campus

The focus of several studies has been the documentation of the prevalence of problem or pathological gambling; however, experts have debated the appropriate time frame for these measures. Should the measure be lifetime prevalence, past-year prevalence, or prevalence during school? Labrie et al\textsuperscript{15} argued that inclusion of summertime, when many students are working and have more disposable income, could alter the prevalence rates. Rates can vary by geographic location and could be influenced heavily by proximity to casinos, a frequent summertime employment site. In fact, LaBrie et al\textsuperscript{15} found that having 2 or more forms of legalized gambling near one’s residence was a significant predictor of gambling problems (odds ratio [OR] = 1.65).

The type of sample used could also account for the variability. Most investigators used a sample of convenience rather than a probability sample. In addition, sample size often has limited the statistical power to ascertain relationships among subgroups of student gamblers (as was the case in our report).

Furthermore, researchers have not used the same questionnaires or surveys; most have used mail surveys, which could have influenced the response rate. The questions have not

### TABLE 4. Statistically Significant Correlates of Problem Gambling and High-Risk Behaviors

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever been in debt because of gambling?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving behavior and violence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn’t regularly wear seatbelts as a driver</td>
<td>50</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>Doesn’t regularly wear seatbelts as passenger</td>
<td>71</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>Drives under the influence of alcohol (DUI)</td>
<td>60</td>
<td>15</td>
<td>24</td>
</tr>
<tr>
<td>Will ride with someone driving under the influence of alcohol</td>
<td>72</td>
<td>18</td>
<td>34</td>
</tr>
<tr>
<td>Has fought with someone while under the influence of alcohol</td>
<td>48</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Alcohol, tobacco, and other drug use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge drinks</td>
<td>88</td>
<td>22</td>
<td>55</td>
</tr>
<tr>
<td>Currently smokes</td>
<td>40</td>
<td>10</td>
<td>21</td>
</tr>
<tr>
<td>Ever used marijuana</td>
<td>48</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>Ever used cocaine</td>
<td>28</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Sexual behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had sex under the influence of alcohol</td>
<td>50</td>
<td>11</td>
<td>18</td>
</tr>
<tr>
<td>Had sex under the influence and regretted it</td>
<td>33</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Have you tried to quit gambling but couldn’t?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving behavior and violence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will ride with someone DUI</td>
<td>46</td>
<td>31</td>
<td>34</td>
</tr>
<tr>
<td>Has fought with someone while under the influence of alcohol</td>
<td>24</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>Alcohol, tobacco, and other drug use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge drinks</td>
<td>47</td>
<td>69</td>
<td>55</td>
</tr>
<tr>
<td>Sexual behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has sex under the influence of alcohol</td>
<td>31</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Disordered eating or dieting behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uses vomiting or laxatives to lose weight</td>
<td>15</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Have you been told you need help for gambling?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving behavior and violence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doesn’t regularly wear seatbelts as passenger</td>
<td>46</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>DUI</td>
<td>37</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>Will ride with someone DUI</td>
<td>47</td>
<td>26</td>
<td>34</td>
</tr>
<tr>
<td>Has fought with someone while DUI</td>
<td>29</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>Alcohol, tobacco, and other drug use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge drinks</td>
<td>69</td>
<td>38</td>
<td>55</td>
</tr>
<tr>
<td>Ever used marijuana</td>
<td>42</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Ever used cocaine</td>
<td>13</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Ever used alcohol in combination with drugs</td>
<td>33</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Disordered eating or dieting behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uses vomiting or laxatives to lose weight</td>
<td>15</td>
<td>11</td>
<td>5</td>
</tr>
</tbody>
</table>

Note. Problem gambling is defined as a “yes” response to the question listed in the table.
\textsuperscript{*}Fisher’s exact test.
been consistent either. The SOGS is the gold standard; however, it is often too long to attach to an already-existing health survey. Achieving the delicate balance between minimizing respondent burden and obtaining useful information is a challenge. Compounding this challenge is the proliferation of gambling venues. As more forms of gambling are legalized and as Internet gambling participation expands, researchers should add more gambling venues to questionnaires to accurately discern the frequency and impact of these venues.

Should investigators include venues, such as charitable gambling for money prizes? Should betting on games of skill like pool or golf be included in the surveys?

In addition, researchers have not adopted a universal monetary level of gambling to be labeled a concern or problem. For example, if someone spends $1 a week on the lottery, although this indicates regular gambling, should that monetary level be a source of concern?

Last, as with any illegal or undesirable behavior, people tend to underreport. Thus, investigators should use caution in interpreting these data; this underreporting could account for the variability in estimates.

**Prevalence of Gambling**

The National Gambling Impact Study Commission Report was published in 1999. On the basis of data from 4 sources, adult rates (all ages) of pathological gambling ranged from 0.8% to 1.5%.

Researchers in a study of student gambling at 6 universities in 5 states—New York, New Jersey, Nevada, Oklahoma, and Texas—reported that 23% of participants gambled weekly. The prevalence of pathological gamblers ranged from 4% in Nevada to 8% in New York. Using meta-analysis of 14 SOGS-based studies, Shaffer, Hall, and Vander Bilt reported that the prevalence of pathological gambling was 5.1%, with a 95% confidence interval (CI) of 3.5% to 7.6%. After examining 66 studies of general households, Shaffer and Hall reported that the student rate of pathological gambling was 3 times the general adult rate. Researchers in the first national survey reported a national prevalence of 2.6% for students who gamble weekly or more often during the school year. This was similar to the past-year adult prevalence rate of 2.25%.

Our SHAP prevalence rates were between 2% and 4% depending on the subgroup examined, and were not restricted to the presence of gambling during the school year.

Slutske, Jackson, and Sher longitudinally examined the prevalence of gambling problems among college students. Applying this longitudinal design over 11 years, they found lower rates of college students with gambling problems. Half of the participants who reported ever having experienced a gambling problem during 1 of the assessments did not report that problem later in the study. This gives rise to the question of whether estimates of gambling problems are better assessed in a cross-sectional or longitudinal design.

Perhaps the most comprehensive study of the relations between gambling defined by SOGS criteria and high-risk behaviors comes from a 2000 survey of 1,348 college students from 4 Connecticut State University campuses.

| TABLE 5. Statistically Significant Correlates of Problem Gambling and Psychosocial Behaviors |
|-------------------------------|----------|----------------|----------|----------|----------|
| Psychosocial variable | Yes % | n | No % | n | p |
| Have you ever been in debt because of gambling? | 76 | 19 | 54 | 552 | .031 |
| Have had trouble falling asleep at night | 42 | 10 | 24 | 229 | .040 |
| Positive score for depression (Beck Depression Inventory) | 28 | 7 | 13 | 124 | .044 |
| Answered positive to “general stress” level is high | 58 | 39 | 73 | 683 | .009 |
| Have you tried to quit gambling but couldn’t? | 35 | 23 | 23 | 213 | .026 |
| Has had difficulty with work (employment) | 25 | 17 | 11 | 107 | .001 |
| Has been told you need help for gambling? | 12 | 8 | 5 | 47 | .016 |
| Positive score for depression (Beck Depression Inventory) | 50 | 27 | 35 | 334 | .027 |
| Has had difficulty with work (employment) | 48 | 24 | 23 | 213 | .000 |
| Ever considered suicide | 44 | 18 | 23 | 217 | .002 |
| Ever attempted suicide | 42 | 12 | 11 | 110 | .002 |
| Have you sought help for gambling? | 27 | 8 | 5 | 47 | .000 |
| Positive score for depression (Beck Depression Inventory) | 18 | 8 | 5 | 47 | .000 |
Although the prevalence in men indicated alcohol–related pathology was the most common gambling venue in the Connecticut study. Investigators in the study examined the frequency of participation for 8 gambling venues—professional sports, college sports, animals, casino, lottery/numbers, Internet, bookies, and games of chance. The researchers designed the study to approximate the US national distribution of full-time 4-year college students. To further improve representativeness, the researchers used data in their analyses that were weighted to the gender, age, and race/ethnicity demographics of each school in the study. The prevalence of gambling, defined as “ever participating in gambling in the past year,” was 52% for men (CI = 50%–55%) and 33% for women (CI = 31%–36%). Again, the most popular type of gambling was the lottery (25% prevalence rate), with 45% of all gamblers choosing this venue. The prevalence of playing games of chance was 13% among gamblers. These results were in line with our SHAP findings, in which the lottery was the most popular venue. Playing cards/games of chance was more prevalent among the men in our sample (33%) than among women.

Comparing our SHAP results with the Connecticut study yielded some noteworthy findings. Playing the lottery was the most common gambling venue in the Connecticut universities study, with 47% of men and 41% of women reporting playing the lottery. Although the prevalence in our study (34% of men and 22% of women) was somewhat lower, we found a significant gender difference that was not found in the Connecticut study. Engwall et al reported a gender difference in prevalence of playing cards (46.9% of men vs 19.4% of women) and betting on sports (40.9% of men vs 10.0% of women). Our data showed a lower prevalence of these gambling venues but a greater gender difference (cards/other games of chance: 33% of men vs 11% of women; betting on sports: 24% of men vs 3% of women).

What was unique in our study was the documentation of a more elevated prevalence of gambling practices among fraternity members. Almost half of all fraternity members reported participating in some type of gambling venue (57% lottery; 54% playing games of chance; 46% gambling on sports). It is no wonder that approximately 1 in 5 reported having gambling debt (17%) or were told to get help with gambling (20%).

Gambling and High-Risk Behaviors

There are reports in the literature of an association between gambling and high-risk behaviors. Comparing the associations across studies is difficult because of the differences in the way these variables have been measured. Even with the difference in variable measurement, investigators have consistently documented a positive association between gambling and more high-risk behavior. For example, in the Connecticut study, researchers gave drug/alcohol use a problem score on the basis of responses to 19 problems with either performance (eg, poor test score, missed classes), relationships (eg, arguments), or awareness (eg, did something you later regretted). The average problem score was significantly higher for problem and pathological gamblers than for others. In our SHAP study, we compared the prevalence of individual high-risk behaviors among never/ever gamblers and found significantly higher prevalence among ever gamblers on all high-risk behaviors involving alcohol and illicit drugs. When they compared patterns of cigarette smoking, Engwall et al observed no relation between gambling and smoking, but we found that smoking was associated with playing the lottery and having gambling debt.

The results from the CAS indicated alcohol–related behaviors were the strongest risk correlates of gambling. Cigarette use, whether in the past year or past 30 days, predicted gambling as did marijuana use. Other illicit drugs were significantly related to gambling. The large sample size \( (N = 9,643) \) provided the researchers with sufficient statistical power to perform logistic regression analysis to illuminate significant predictors of gambling. The strongest predictor was being male \( (OR = 2.12) \), followed by watching TV \( (OR = 1.87) \) and age \( (> 21 \text{ years}, OR = 1.50) \). Binge drinking remained in the model \( (OR = 1.44) \), as did drinking leading to unprotected sex \( (OR = 1.34) \). Although our study does not have the statistical power required for logistic regression, our SHAP findings consistently supported the existence of a relation between alcohol and gambling, particularly as it influenced riding in a car with someone who was under the influence and having sex under the influence. Researchers in the CAS also reported that fraternity/sorority affiliation was associated with gambling \( (OR = 1.26 \text{ in univariate mode, } OR = 1.17 \text{ in the multivariate model}) \). Again, our findings support that relationship. We found that the largest prevalence rates for every gambling venue were among members of fraternities. Likewise, prevalence rates for having gam-
bling debt or being told to get help were higher for fraternity members than for members of any other subgroup.

Recommendations

Many of the top health-related problems among college students are related to impulse-control or addiction. Because these behaviors are often linked to or reinforce each other, Engwall et al. recommended screening for gambling among students with substance and eating problems. Those authors also recommended that campuses develop prevention/education programs that include information on responsible gambling and awareness of signs and symptoms of problem gambling. Our study results lend support to those recommendations and indicate that screening for gambling, given any high-risk behavior, might be warranted. Our results also underscore the need for intervention.

Given the prevalence of gambling among athletes—especially male athletes—universities’ athletic departments could be a good place to routinely deliver prevention and education programs. The NCAA has produced materials on sports wagering that are strongly recommended to be included as a part of coaching. Another group that should be targeted are fraternity members, given the patterns observed in our study and the CAS.

Regardless of whether college administrators start by providing programs to athletes, within club/organization settings, or within residence halls, gambling is a health-related problem that deserves serious attention. Several partners throughout the university community could be engaged in identification and intervention efforts, such as counseling services, student health services, financial aid offices, and orientation and retention services. Engagement of these partners would set the stage for proactive interventions again driven by observational trends from ongoing surveys.

Experts also should intensify and focus gambling research to continue monitoring the trends in college gambling and identify new venues. Future surveys should contain consistent evaluation tools, such as the SOGS (or abbreviated versions), that can be easily added to ongoing surveys of college health. First, this would provide a consistent tracking in the literature and a basis for comparison of trends across various settings and populations. Second, this would provide institutions with data that could be used to set agenda for campus-wide counseling and interventions. Larger samples and data pooling would allow for the use of multiple logistic models to tease out the interrelations of gambling and other high-risk behaviors. Third, this would contribute to the understanding of the problem and the development of intervention strategies to address it.

Financial concerns and issues are influential in student retention and affect the quality of life. Increasing awareness and intervention efforts on the basis of documented trends are important aspects of survey research. Findings from such well-designed, focused surveys would provide scientific rationale for programs, legislation, and interventions that could be a powerful force in reducing the destructive effects of gambling.

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NOTE

For comments and further information, address correspondence to Dr Wendy L. Stuhldreher, Department of Health and Safety, Slippery Rock University, Slippery Rock, PA 16057 (e-mail: Wendy.Stuhldreher@sr.edu).

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