Gambling and Other Risk Behaviors on University Campuses

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In 1995, the National Center for Disease Prevention and Health Promotion conducted a survey profiling the health of US college and university students (Douglas, Collins, Warren, Kann, Gold, Clayton, Ross, & Kolbe, 1997). This comprehensive study and many others indicate that college students engage in a variety of risky behaviors, such as the excessive use of alcohol, unprotected sexual activity, driving while intoxicated, and use of illicit substances (Schneider & Morris, 1991; Wechsler, Dowdall, Davenport, & Castillo, 1995; West, Moskal, Dziuban, & Rumbough, 1996). In recent years the concern of the campus community has focused on binge drinking (Wechsler, Lee, Kuo, Seibring, Nelson, & Lee, 2002) and how binge drinking interacts with use of other drugs (Jones, Oeltmann, Wilson, Brener, & Hill, 2001).

Student involvement in gambling and problem gambling has been relatively overlooked in the study of risk-taking behavior. This is unfortunate, however, as it is reasonable to expect that the growth of legalized gambling over the past decade would result in an increase in student gambling and gambling problems, including students who gamble at a pathological level. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, 2000), pathological gamblers experience loss of control and multiple negative consequences as they chase their losses in an ever-deepening spiral. Pathological gambling in minors has been associated with a variety of negative and addictive behaviors, including low grades, and high rates of alcohol, tobacco, and illicit drug use (Stitt, Grant, & David, 2000). Many gambling venues are available to college students. In many states the legal age for gambling, including high-stakes games, is 18 years of age (Lesieur, 1996). Most Americans now live within a four-hour drive of a gambling casino (Winters, Bengston, Dorr, & Stinchfield, 1998). Internet gambling is available to anyone who has access to the Internet (Anderson, 2001).

In the last several years, the discovery of sports betting networks operated on campus by students has become a nationwide concern (Oster & Knapp, 1998). Rings of illegal bookmaking by college students were uncovered during the last decade at universities in Michigan, Florida, South Carolina, Texas, Arkansas, Iowa, Maine, and Rhode Island (Rhoden, 1992). In 1996, The National Collegiate Athletic Association (NCAA) conducted an infractions survey, which found that 3.7% of the Division I student-athletes reported betting on a game in which they played, and 25.5% said they had gambled money on other college sporting events (Cullen & Latessa, 1996).

The National Association of Student Personnel Administrators (NASPA) has stated that problem gambling is not just a concern for student athletes (McCellan, Caswell, Beck, Hollady, Mitchel, & O'Connor, 2002). NASPA advocates that college officials increase their awareness of the potential health risks associated with gambling. They further recommend that materials related to problem gambling be integrated into student prevention and treatment programs.

In a survey of Massachusetts high schools and colleges, Shaffer, Forman, Scanlan and Smith (2000) found that, while 82% of the institutions conducted regular health surveys, only 5% had ever asked questions about gambling. College administrators reported an awareness of problem gambling as an issue but most of the concern related to following the NCAA guidelines for student athletes. When asked about coverage of gambling issues in the curriculum, students were likely to discuss gambling in mathematics and statistics classes but rarely in health or social sciences courses. The authors concluded that higher education provided few opportunities for students and faculty to learn about gambling and its potential hazards.

Most campus-based prevalence studies of problem gambling have employed the South Oaks

Gambling Screen (SOGS), a 20-item screening scale developed by Lesieur and Blume (1987). While originally developed to screen for pathological gambling in clinical settings, the SOGS has been expanded for other purposes, settings, and populations, including prevalence studies of pathological gambling in the general population (Stinchfield, 2002). In a college gambling survey conducted at The University of Minnesota, Lesieur and Blume (1987) used the SOGS and questions about amount lost while gambling, perceptions of peer gambling, and personal finances and spending. Five percent of the 384 college students surveyed were classified as pathological gamblers, the most severe, addictive level.

Schaffer, Hall, and Bilt (1999), in a meta-analysis of 23 college studies using SOGS, found 5.0% of students at the pathological level and another 7.0% at the problem level, a moderate to low level of gambling problems. It should be noted that college rates were much higher than the adult population with 1.7% at pathological and 3.4% at problem levels. Meta-analysis for high school rates were similar to college rates. Given the recent increase in both access and social acceptability of gambling, these higher rates in college students might be more than just an adolescent phase (Shaffer, Hall, & Bilt, 1999). Only longitudinal studies will show the extent to which college students moderate their gambling as they age.

Research and clinical practice show that pathological gambling does not occur in isolation but rather tends to co-occur with other addictive behaviors. That is, many such problem behaviors tend to cluster together, such that individuals who exhibit one type of problem behavior tend to engage in several others. Such behavioral clustering has been shown to occur among drug and alcohol use, high-risk sexual behavior, gambling, and eating disorders (Gambino, Shaffer, & Cummings, 1992). Very few college-based health studies have examined the interaction of gambling and other risky behaviors.

In a multi-campus study across 5 states of the U.S., a team headed by Lesieur (Lesieur, Cross, Frank, Welch, White, Rubenstein, Moseley & Mark, 1991) found that scores on the SOGS were positively correlated with the greater use of tobacco, alcohol and other drugs. Pathological gambling was negatively correlated with grade point average. Compared to the rate found in women (2.4%), men (9.3%) were significantly more likely to be labeled as pathological gamblers. At three colleges in Quebec, Ladouceur, Dube, and Bujold (1994) found that higher SOGS scores predicted greater tobacco, alcohol, and other drug use, as well as overeating. Significant gender differences were observed, with men (5.7%) exceeding women (0.6%) at the pathological gambling level. Students often experienced financial difficulties, borrowing from friends and banks to support their gambling habits. Gambling activities encroached on the time normally given to studying or work.

The current study examines the interaction of gambling and problem gambling with other risk-taking behaviors in students attending college in a pro-gambling culture with many legalized gambling opportunities. In Connecticut, the lottery is available in approximately 2900 locations, pari-mutual gambling is available at various sites across the state, and two major tribal casinos are located in the southeastern part of the state. As is typical of many public universities, most Connecticut State University (CSU) students come from homes of moderate incomes and many hold part-time jobs to help pay their college and living expenses. All four of the CSU campuses have well-developed prevention campaigns to deal with drug and alcohol use. In order to develop appropriate prevention and intervention programs, an accurate assessment of level of gambling and problem gambling was deemed necessary. Based on evidence in the literature suggesting the clustering of gambling and other risky behaviors, the student health research team of the CSU System decided to include gambling in an established assessment program.

METHOD

Respondents

Since 1988, the Connecticut State University (CSU) survey project has been assessing student health behaviors on the four campuses. The survey was conducted annually from 1988-1991 and again in 1996 and 2000 to provide assessment data for ongoing prevention activities. In order to reflect differing enrollments at each campus, 500 students were targeted for Central Connecticut State University (CCSU) in New Britain, 500 for Southern Connecticut State University (SCSU) in New Haven, 300 for Western Connecticut State University (WCSU) in Danbury, and 200 for Eastern Connecticut State University (ECSU) in Willimantic.

Of the 1500 questionnaires distributed for the 2000 study, 1348 (90%) were completed and returned to be used in the analysis of the data. Across all campuses, more women (64%) than men (36%) responded to the survey and most were in the 18-20 (50%) and 21-25 (35%) age brackets. Most of the respondents either lived with parents or spouse (44%) or in a residence hall (34%). Of the remaining students living in off-campus apartments, 16% lived with two or more persons. The students were fairly well distributed throughout the Freshman-Senior range and 6% of them were at the graduate level. Most students (77%) held paying jobs while attending CSU, with 38% working more than 20 hours a week.

Survey Instrument

Overall the survey contained 120 questions, some of which could be skipped if the students had little drug experience. A short section on smoking was followed by a more extensive section on alcohol use. Next there were several sections containing questions on the use of specific drugs or drug categories: marijuana, cocaine, amphetamines, tranquilizers, psychedelics, pain-killers, steroids, and inhalants. The next section asked about students' attitudes toward drugs, including perceived risks associated with drug use and experienced consequences of drug use. The next items in the questionnaire asked for age, gender and other personal data. The last two sections of the survey dealt with binge eating and gambling.

To assess problem and pathological gambling, The South Oaks Gambling Screen (SOGS) was used but shortened because of the overall length of the health survey. All scoreable items were included with the exception of SOGS questions #10 (would like to stop but didn't think you could) and #16 that lists 9 sources from which the respondent borrowed money (e.g., household money, spouse, credit cards). The 9 items of question #16 were replaced by one question that combined various money sources into 5 categories and the respondent was asked to select the one primary borrowing source. These sources were listed as (A) Household money, (B) Spouse or other family members, (C) Bank or credit cards, (D) Sold personal property, stocks, or bonds, and (E) Loan sharks, bookies, or casinos. The respondent received one point for selecting any one of the items. Our version of this screening instrument, referred to as SOGS-CT, reduced the emphasis in SOGS scoring on the sources of gambling-related borrowing. Whereas the complete SOGS has 20 scoreable items, the SOGS-CT contained only 11 scoreable items. In addition, 10 of 11 gambling venues on the SOGS (e.g., casino, lottery) were selected to be included in this survey. As in the SOGS, students were asked if they used each venue "never", "ever", or "once a week or more". Students reporting "never" to every one of the 10 venues were defined as nongamblers.

Procedure

On each campus, surveys were distributed to faculty members whose classes were selected to provide a cross-section of the student population on that campus. The survey was administered by faculty during classtime during the fall semester of 2000. Students' responses were recorded on computer scored answer sheets. Information on the answer sheets was transferred via optical scanner to a database where it was analyzed with SPSS software.

RESULTS

Gambling Categories

When SOGS-CT scores were calculated by adding the number of items to which the respondent gave a "yes" answer, over half (53%) of the students (N = 1301) had a score of zero. Respondents with scores of zero, 1, or 2 were considered social gamblers. Students with scores of 3 or 4 were placed in the category of problem gambler, while those with a score of 5 or more were listed as potential pathological gamblers. The categorization of these gambling types followed the convention suggested by Volberg and Steadman (1988). In our study, we also distinguished a nongambling group that included students who reported that they never gambled and also had a SOGS score of zero. Due to the considerable gender differences, the percentage of students in each of these four categories of gambling type is presented in the following section comparing the rates between men and women.

Gender and age differences

As in previous college-based studies (Lesieur, Cross, Frank, Welch, White, Rubenstein, Moseley & Mark, 1991; Ladouceur, Dube, & Bujold, 1994), the rate of problem and pathological gambling was significantly higher for men than for women, χ^2 (3, N=1293) = 76.446, p<.001. See Table 1. The percentage of men falling in the problem and pathological categories summed to 18.3%, while only 4.4% of women fell into these categories. Since the CSU male/female ratio is closer to 50/50 than the 36/64 ratio seen in the sample, we projected a gender-balanced percentage of 6.2% for problem gamblers and 5.2% for the pathological category. When students over the age of 21 were compared with those under that age, no significant difference was found in the rate of problem and pathological gambling. Of the 686 students who were under 21, 7% (N = 46) of these were under the age of 18. Results from this under 18 group were merged with the under 21 group due to similar findings and small sample size.

TABLE 1

Gender and Type of Gambler

Type of Gambler	Male % n = 469	Female % n = 824	Average % (Gender balanced)
Nongambler	23.5	36.5	30.0
Social	58.2	59.0	58.6
Problem	9.8	2.5	6.2
Pathological	8.5	1.9	5.2

Borrowed funds

When considering the primary source of borrowed funds, household money was the primary source for social gamblers. As seen in Table 2, problem and pathological gamblers were significantly more likely to turn to additional fund sources, $\chi^2(12, N = 475) = 78.798$, $p < .001$.

TABLE 2

Source of Borrowed Funds for Gambling

Type of Gambler	Household Money %	Family %	Credit Cards %	Sold Property %	Bookie Loans %
Social	83	9	7	1	1
Problem	61	18	15	2	4
Pathological	32	38	15	8	8

Specific SOGS questions by gambling type

After excluding students who were classified as nongamblers, each SOGS question was examined for response pattern by the three remaining gambling groups. Social gamblers had low response rates on most questions except borrowing from a money source and gambling more than intended. Problem and pathological gamblers gave higher but similar response rates on these two questions. On all of the remaining nine SOGS questions, pathological gamblers had the highest percentage of “yes” responses, followed next by problem gamblers and last by social gamblers (See Table 3). Clearly students who gamble at a problem or pathological level have multiple negative consequences that could affect their social, work, and academic performance, (e.g., 42% of pathological gamblers reported having lost time from work or school).

TABLE 3

Response rate to SOGS questions by gambling type

SOGS #	Abbreviated text	Gambling type: Social % n = 574	Problem % n = 69	Pathological % n = 56
16	Borrowed from money source	44.9	75.3	87.5
7	Gamble more than intended	20.7	73.5	78.0
9	Feel guilty about gambling	5.1	55.4	72.2
8	Criticized or told had problem	1.4	13.6	66.7
6	Feel had problem with gambling	1.0	30.4	65.5
5	Lied about losses	2.1	30.9	63.0
13	Money arguments about gambling	0.3	14.9	61.5
11	Hidden signs of gambling	0.3	19.4	58.0
15	Lost time from work or school	0.9	12.3	41.8
14	Borrowed and not paid back	0.5	20.9	38.5
4	Go back to win back	2.2	13.0	26.8

Gambling venues

Ten different gambling venues, listed in Table 4, were included in this survey. As in the SOGS, students were asked if they used that venue “never”, “ever”, or “once a week or more”. Since the ten venues covered almost all of the ways that students could have gambled, it is reasonable to conclude that overall at least 67% had ever gambled (76% of the males and 62% of the females) in at least one venue.

Thirty-eight percent of women and 24% of men said they never gambled at any of the venues. These individuals were considered as nongamblers in the analysis. The average number of venues gambled was significantly higher in men ($M = 3.3$) than in women ($M = 1.9$), $F(1, 1263) = 89.046$, $p < .001$.

Gambling venues by gender: Overall, both men and women played the lottery more than any other form of gambling. Of all 10 venues, the level of female gambling equaled male gambling only in casinos, slot/poker machines, and bingo. In Table 4 the top five gambling venues for men were lottery, playing cards, betting on sports, skill games, and casino gambling. Women preferred lottery, casinos, slot/poker machines, bingo, and playing cards. Men were about 4 times more likely than women to have bet on sports and played games of skill for money; 3 times more likely to have bet on animals; and twice as likely to have gambled in the stock market and played dice games.

TABLE 4

Gambling Venues (Ever Used) and Gender

Gambling Venue Ever Used	Male % n = 455	Female % n = 810	Average % (Gender Balanced
Lottery	47.1	40.8	43.9
Casino	33.5	33.3	33.4
Play cards	46.9	19.4	33.2
Slot/poker machines	31.4	30.9	31.1
Skill games	40.3	11.8	26.1
Bet on sports	40.9	10.0	25.4
Bingo	25.5	24.1	24.8
Dice games	27.0	12.2	19.6
Stock market	25.7	9.7	17.7
Bet on animals	15.3	4.8	10.1

Venue choices and age: Casino games and slot/poker machines were significantly used more by the 21 plus group, likely due to the fact that 21 is the legal age for casino gambling in Connecticut. The lottery was also preferred significantly by the over 21 group, even though 18 is the legal age for purchasing a lottery ticket in Connecticut (See Table 5).

TABLE 5

Gambling Venues (Ever Used) and Age

Gambling Venue Ever Used	Under 21 yrs % n = 691	21 yrs and over % n = 609	χ^2
Casino	17	52	***
Lottery	36	51	***
Slot/poker machines	18	47	***
Play cards for money	30	28	ns
Bingo	24	25	ns
Skill games	25	20	ns
Bet on sports	23	19	ns
Stock market	12	19	**
Dice games	19	16	ns
Bet on animals	9	9	ns

******p<.01; ***p<.001; ns = not significant for age differences.

Gambling category and venue choice

Venue choices (ever used): When asked if they had ever used a venue, social gamblers showed definite preferences for the lottery (62%), casino games (46%), slot/poker machines (42%), and playing cards (38%). In Table 6, the top four rankings for problem gamblers were more similar to social gamblers than to pathological gamblers. Except for the lottery, the percentage of problem gamblers ever using any venue was much greater than of the corresponding percentage for social gamblers. Differences in venue preferences between problem and pathological gamblers were slight. For pathological gamblers, with the exception of playing cards (79%), there were similar percentages across casino, slot/poker machines, skill games, lottery, sports betting, and bingo.

TABLE 6

Gambling Venues Ever Used and Gambling Type

Percentages Ever Using Venue: Venues Ranked by Preference within Each Type

Social n = 574		Problem n = 69		Pathological n = 56	
Lottery	62	Lottery	71	Play cards for money	79
Casino	46	Slot/poker machines	71	Casino	67
Slot/poker machines	42	Play cards for money	70	Bet on sports	66
Play cards for money	38	Casino	67	Skill games	66
Bingo	33	Skill games	61	Lottery	64
Skill games	27	Bet on sports	58	Slot/poker machines	63
Bet on sports	26	Bingo	46	Bingo	61
Dice games	22	Dice games	42	Stock market	56
Stock market	19	Stock market	39	Dice games	50
Bet on animals	8	Bet on animals	37	Bet on animals	43

Social gamblers used significantly fewer venues (M = 3.2) than did the problem (M = 5.6) and pathological (M = 6.1) groups, $F(3, 1259) = 424.37$, $p<.001$. Pairwise comparisons using the Scheffe test confirmed this significant difference but showed no significant difference between the problem and pathological groups.

Frequent gambling venues: When asked if they had used a venue once a week or more, social gamblers were not frequent users of any of the venues (See Table 7). Problem gamblers showed slight preferences for the stock market, lottery, casino and sports betting. Pathological gamblers were about twice as likely as problem gamblers to frequent all the venues. Playing cards for money and skill games were more preferred by pathological gamblers when compared with the problem category. While rated fairly low as a venue ever used (Table 6), gambling on the stock market rose to the top of the list of frequently used venues (Table 7). Stock market gambling was ranked number one among problem gamblers (14% using once a week or more), and number two among pathological (26%) and social (4%) gamblers.

TABLE 7

Gambling Venues Used Once a Week or More and Gambling Type

Percentages Using Venues Weekly: Venues Ranked by Preference within Type

Social		Problem		Pathological	
Lottery	5	Stock market	14	Play cards for money	28
Stock market	4	Lottery	13	Stock market	26
Skill games	3	Bet on sports	12	Bet on sports	24
Play cards for money	3	Casino	10	Skill games	24
Bet on sports	3	Skill games	8	Lottery	23
Dice games	2	Play cards for money	7	Bingo	15
Casino	1	Bet on animals	7	Slot/poker machines	13
Bingo	1	Slot/poker machines	6	Casino	13
Slot/poker machines	1	Dice games	6	Dice games	12
Bet on animals	1	Bingo	3	Bet on animals	6

Gambling and drug/alcohol problems

Students were asked whether they had experienced any problems associated with drugs and alcohol use. Nineteen problems were listed including effect on health (e.g., hangover, memory loss), performance (e.g., did poorly on a test, missed a class), relationships (e.g., got into an argument, was criticized), and awareness of problems (e.g., did something later regretted, tried unsuccessfully to stop drinking). An overall score for each respondent was computed by awarding one point to each of the 19 problems.

The average drug/alcohol related problem scores for problem and pathological gamblers were significantly higher than the average scores for social gamblers and nongamblers , $F(3, 1070) = 14.983$, $p < .0001$. Posthoc Scheffe tests, performed on pairwise comparisons, are reported in Table 8. The nongambling and social groups were significantly different from each other and the other two groups. The problem and pathological groups were not significantly different from each other. Overall men had a higher rate of drug/alcohol related problems than did women $F (1, 1055) = 4.060$, $p < .05$.

TABLE 8

Number of Drug and Alcohol Problems by Gambling Type

Type of Gambler			
Nongambler	Social	Problem	Pathological
4.3a	5.2b	7.5c	7.4c

Note: Means in the same row that do not share subscripts differ at $p < .05$ in the Scheffe significant difference comparison.

The complete list of drug and alcohol related problems is shown in Table 9. In most cases problem and pathological gamblers were significantly more likely than the other two groups to have at least one

occurrence of the problem within the last year. Likely many of these differences were due to the higher rate of drug and alcohol use by students who gamble at problem levels. Chi-square tests were conducted to assess significant differences.

TABLE 9

Drug and Alcohol Problems Contrasted by Gambling Type

Percentage Reporting Problem by Type:	Nongambler	Social	Problem	Pathological	χ^2
Hangover	63	72	81	68	**
Nausea/vomit	54	61	66	56	ns
Memory Loss	32	37	49	44	*
Felt harmed health	20	25	37	32	*
Athletic performance hurt	14	22	45	37	***
Did poorly on test/project	26	30	41	50	**
Missed class	35	42	50	60	**
Drove under influence	35	45	65	55	***
DWI/DUI arrest	5	3	6	13	***
Trouble with authority	14	15	28	31	***
Damage property	10	12	35	23	***
Argument or fight	30	40	62	51	***
Criticized by someone	30	33	55	56	***
Taken advantage of sexually by someone	13	12	12	21	ns
Took sexual advantage of someone	7	6	15	19	***
Regretted actions	39	48	70	50	***
Thought had problem	13	14	28	32	***
Tried to stop	7	8	19	25	***
Suicidal thoughts	7	7	16	22	***

*p<.05; **p<.01; ***p<.001; ns = not significant.

Gambling and drug use

The gambling categories were contrasted for the occurrence of drug and alcohol use. There were no significant differences between the gambling groups in the usage rates for most illegal drugs, such as cocaine, psychedelics, and opiates. Significant differences were only observed in the more widely used legal drugs (i.e., cigarettes and alcohol) and marijuana.

Cigarette smoking: Overall there were no gender differences in cigarette smoking. Equal

percentages (27%) of men and women reported that they regularly smoked half a pack or more a day. Regular smoking rates were significantly higher in problem (38%) and pathological (39%) gamblers when compared with the social (27%) and nongambling groups (23%), $\chi^2(12, N = 1018) = 31.49, p < .002$.

Marijuana use: When students were asked about their marijuana use, 31% reported smoking the drug within the last month. Men (38%) were significantly more likely than women (26%) to be monthly users of marijuana, $\chi^2(4, N = 885) = 42.052, p < .001$. The monthly use was similar for the nongambler (28%) and social (33%) groups. In contrast, problem (52%) and pathological gamblers (56%) were significantly more likely to have smoked marijuana within the last month, χ^2 (3, N =1184) = 26.96, $p < .001$.

Binge drinking: When students were asked if they had consumed five drinks on one occasion with the last two weeks, 42% reported an episode of binge drinking. As seen in most campus surveys, men (62%) were significantly more likely than women (38%) to have had a binge drinking episode, $\chi^2(4, N = 1169) = 93.149, p < .001$. Nongambling (40%) and social (47%) groups showed percentages very close to the norm of 42%. Problem (70%) and pathological gamblers (74%) were significantly higher in reporting an episode of binge drinking, χ^2 (3, N = 1156) = 36.254, $p < .001$.

Risk assessment of regular drug use

The survey contained 34 items that asked the respondent to assess the risk of trying and regularly using a variety of legal (e.g., tobacco and alcohol) and illegal (e.g., cocaine, heroin, and marijuana) drugs. For each item, risk was judged by the student to be "no risk" (1), "some risk" (2), or "great risk" (3). Students also had the option of selecting "don't know" which was scored as a zero. Rather than comparing all items individually, a total risk assessment score was calculated for the risk of regular use of 9 drugs. If a student attributed great risk to regularly using each of the 9 drugs, the highest score would be 27. Nongamblers (M = 23.6) and social gamblers (M = 24.3) saw greater risk in the use of the substances than did problem (M = 22.5) and pathological (M = 22.2) gamblers, $F(3, 1239) = 9.242, p < .001$. Even though all groups gave scores indicating a high assessment of risk, problem and pathological gamblers were less likely to see regular drug use as carrying great risk. No significant gender differences were observed in the assessment of risk.

Binge Eating and Weight Control Measures

In a series of questions about eating and weight control, students were asked how many times a month they recalled "rapidly eating a very large amount of food". Problem and pathological gamblers reported significantly higher binge eating rates than did the nongambling and social groups , $F(3, 1273) = 14.90, p < .001$ (See Table 10). Overall the mean number of binge episodes per month was significantly higher in males (M = 4.4) than in females (M = 3.6), $F(1, 1273) = 8.767, p < .003$.

TABLE 10

Average Monthly Binge Episodes by Gambling Type

Gender	Type of Gambler			
	Nongambler	Social	Problem	Pathological
Male	4.1	3.5	4.3	5.6
Female	2.5	2.6	4.5	4.8
Overall	2.9a	2.9a	4.4b	5.3b

Note: Means in the same row that do not share subscripts differ at $p < .05$ in the Scheffe significant difference comparison.

Students were asked if they employed the following five measures to control their weight: vigorous exercise, vomiting food, laxatives, 24 hour fast and diuretics. Each student was rated on a scale of 0 to 4 on the amount that method was used, with 0 being never and 4 being more than once daily. A total weight control score was calculated for each student by summing the scales on all five methods. This weight control score had a minimum of 0 and a maximum of 20 points. Social gamblers, nongamblers, and problem gamblers had the lowest weight control scores, with pathological gamblers having a significantly higher average, $F(3, 1286) = 21.677$, $p < .001$ (See Table 11).

TABLE 11

Weight Control Scores by Gambling Type

Type of Gambler			
Nongambler	Social	Problem	Pathological
1.9a	1.8a	2.4a	4.1b

Note: Means in the same row that do not share subscripts differ at $p < .01$ in the Scheffe significant difference comparison.

Sports participation and gambling behavior

Participation in sports has often been associated with problem gambling in college students (Oster & Knapp, 1998). In the CSU survey students were asked whether or not they participated in team sports (club or intercollegiate). The percentage of male team athletes involved in problem and pathological gambling (26%, n=122) was significantly higher than the rate among nonathletes (16%, n = 343), χ^2 (3, N = 465) = 7.821, $p < .05$. The same pattern was seen in female athletes where the percentage of problem and pathological gamblers (7%, n = 85) significantly exceeded the rate among nonathletes (4%, n = 733), χ^2 (3, N = 818) = 8.459, $p < .03$.

When asked about their choice of venues, students involved in intercollegiate athletics and club sports showed significant preferences towards playing cards, betting on sports, playing skill and dice games, and betting on animals. For other venues club sports participants had choices similar to nonathletes (i.e., casino and slot/poker machines) as seen in Table 12.

TABLE 12

Venue Choices by Athletic Participation

Percentage Ever Using Venue	Nonathletes	Club Sports	Intercollegiate Sports	χ^2
Play cards	27.1	37.3	39.9	**
Lottery	44.4	40.6	34.3	ns
Bet on sports	18.8	30.4	33.6	***
Skill games	19.8	34.8	31.9	***
Dice games	15.7	27.9	26.6	***
Slot/poker machines	32.1	29.0	25.2	***
Casino	34.6	33.8	24.5	*
Bingo	24.2	33.3	23.9	**
Stock market	14.6	19.1	20.8	ns
Bet on animals	7.1	18.8	15.4	***

* p <.05; ** p < .01; *** p < .001; ns = not significant

DISCUSSION

The major findings of this study were that a minimum of one out of nine students at four Connecticut universities had a gambling problem which was significantly connected to substance and food related problems. When problem and pathological gambling groups were compared to social gamblers, the following significant differences were found: greater number of gambling venues tried and with greater frequency; greater tobacco, alcohol and marijuana use; greater binge drinking; greater number of drug and alcohol related health, social and performance problems; lower assessment of risk associated with drug and alcohol use; greater binge eating and efforts at weight control.

Social gamblers and non-gamblers were similar with regard to the following: drug and alcohol use; extent of binge drinking; extent of binge eating and weight control efforts. Social gamblers, compared with non-gamblers, did experience a higher rate of problems related to drug and alcohol use. For the most part, however, gambling in moderation was not found to be associated with the negative effects reported for problem and pathological gamblers.

In comparing Connecticut statistics, the level of gambling problem in the current college/university study, 11.4%, was similar to the rate previously found among Connecticut high school students, 11.3%, (Steinberg, 1997) and both were more than double the rate found for the general adult population, 5.4%, (WEFA, 1997). The levels of problem and pathological gambling in the high school, university and general

adult population studies found in Connecticut were similar to the rates that have been found in other studies (Shaffer et al., 1997).

COMMENT

The high level of problem and pathological gambling among college/university students consistently found across studies and its association with substance and food related problems warrants the significant concern of authorities on college/university campuses and needs to be forthrightly addressed.

Implications for Campus-Based Programs

1. Campus Counseling Services

   Campus counseling services need to operate with the awareness that excessive behaviors are often linked and reinforce each other. When students are found to have substance and food concerns screening for gambling is recommended. In turn, an identified concern about problem and pathological gambling should signal a need to screen for substance abuse (especially tobacco, alcohol and marijuana) and for binge eating. Patterns of related dysfunctional behavior may be addressed simultaneously or sequentially depending on such factors as severity of the problems and capacity and receptivity of the individual. It is important to determine whether one of the problem areas is primary. For example, a student may escape the negative consequences of a primary gambling problem through excessive drinking. If the drinking is identified and treated and not the gambling, treatment for the alcohol problem will typically not be successful or the student may develop alternative dysfunctional behaviors to cope with the negative consequences of the gambling.

2. Curriculum Infusion

   Based on prevalence rates across age groups, especially among young adults, gambling and problem gambling warrant inclusion in various college curricula, including public health, mental health, and addictions.

3. Prevention Programs

   Campus based prevention programs should include information on responsible gambling and signs and symptoms of problem and pathological gambling.

4. Athletic Teams

   Research studies at colleges and universities have identified higher rates of problem gambling among students who engage in intercollegiate sports than among non-athletes. Athletes who are problem gamblers and who are in significant debt, especially to bookies and loan sharks, are particularly vulnerable when approached with schemes to shave points and fix games. The current study found that athletes significantly more often gambled in sports than non-athletes and had significantly higher levels of problem and pathological gambling. Although male students in this study were at approximately four times greater risk than females (18.3% vs. 4.4%), both male and female athletes were at significantly greater risk for a gambling problem than male and female non-athletes, respectively. It is recommended that the coaching staffs and athletes of the teams of both men and women receive specialized education about gambling and problem gambling.

Research Implications

1. Stock Market Gambling

   Stock market problem gambling has emerged during the last decade as a growing concern in the problem gambling field (Steinberg and Harris, 1995). In the current study, stock market gambling was demonstrated to be frequently engaged in by problem and pathological gamblers. As students join the full-time work force and have more available funds, stock market investment and associated speculation/gambling may become an even greater societal concern and deserves more in depth study over time beginning in late adolescence.

2. Online Gambling

   Given that online gambling has increased significantly throughout the world over the last decade (International Gaming and Wagering Business, 2002), it will be important in future research to assess the level of online gambling on campus. Virtually all students have immediate access to a personal computer and, therefore, may gamble at almost any time at numerous online recreation gambling and financial markets trading sites

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