

# Taking Chances: Problem Gamblers and Mental Health Disorders—Results From the St. Louis Epidemiologic Catchment Area Study

## ABSTRACT

**Objectives.** This study determined prevalence estimates of problem gambling and relationships to other psychiatric and substance use disorders.

**Methods.** In 1981, the Diagnostic Interview Schedule was used to collect epidemiological information on problem gambling and other disorders from 3004 adults in St. Louis, Mo.

**Results.** The lifetime prevalence of pathological gambling was 0.9%; 46% of those surveyed gambled recreationally. Problem gamblers (those reporting at least one gambling-related problem) were 9.2% of the sample and were predominately White (69%), male (78.2%), and younger than nongamblers. They were at increased risk for several psychiatric diagnoses, especially for antisocial personality disorder, alcoholism, and tobacco dependence.

**Conclusions.** Clinicians treating alcoholism and tobacco dependence may need to screen for problem gambling. Additional research in the context of increased gambling opportunities is needed. (*Am J Public Health*. 1998;88:1093–1096)

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## Introduction

In 1980, pathological gambling was included for the first time as a psychiatric disorder in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III), the official diagnostic manual of the American Psychiatric Association.<sup>1</sup> By definition, pathological gamblers are persons who are chronically and progressively unable to resist impulses to gamble and whose personal lives or vocational pursuits have been compromised by their gambling. Gambling behavior that falls short of meeting these criteria is sometimes referred to in the literature as “problem gambling.”<sup>2</sup>

Studies of persons in Gamblers Anonymous or treatment facilities have estimated rates of pathological and problem gambling at between 7% and 14%, with increased comorbidity with depression, suicidality, and substance abuse.<sup>3–11</sup> However, there is a dearth of epidemiologic studies of adult pathological gambling.<sup>12</sup> In studies using the South Oaks Gambling Screen,<sup>13</sup> the prevalence of pathological gambling ranged between 0.1% and 2.3% among adults in 5 US states<sup>15</sup> and was 1.2% among Quebec residents<sup>15</sup> and 2.8% among Quebec college students.<sup>16</sup> One epidemiologic study of residents in Edmonton, Alberta,<sup>17</sup> using the Diagnostic Interview Schedule (DIS),<sup>18,19</sup> estimated a lifetime prevalence of 0.4%, a male-to-female ratio of 3:1, and an onset of gambling between 25 and 29 years. Pathological gamblers had high rates of suicide attempts (13.3%), felony convictions (26.7%), perpetration of spouse or partner abuse (23.3%), perpetration of physical child abuse (16.7%), and unemployment (40%).

We analyzed the St. Louis Epidemiologic Catchment Area data to estimate problem and pathological gambling among St. Louisians and to explore the association between gambling and psychiatric and substance use disorders.

## Methods

St. Louis, Mo, was one of 5 sites in 1981 to participate in the National Institute of Mental Health–funded Epidemiologic Catchment Area Study of mental disorders in the general population.<sup>20</sup> The multistage sampling strategy and oversampling of African Americans is described in detail elsewhere.<sup>20,21</sup> A total of 3004 St. Louisians from households were interviewed. To assess several psychiatric and substance use disorders, the study used the DSM-III–based DIS,<sup>18,19</sup> a structured diagnostic instrument designed for nonclinicians. St. Louis was the only site to include gambling questions.

Not all of the DIS gambling questions matched the DSM-III criteria, and not all criteria were assessed; thus, in this paper disorders are labeled “DIS/DSM-III.” To meet DIS criteria for pathological gambling, persons must have gambled at least twice in their lives; thought that they gambled too much; and said that they had experienced at least 2 of the following because of gambling or betting: (1) inability to pay bills; (2) trouble at home or work; (3) borrowing or stealing money. We omitted antisocial personality disorder as a DSM-III gambling exclusionary criterion to allow examination of diagnostic overlap between that disorder and gambling.<sup>22</sup>

The sample was stratified into 3 mutually exclusive groups: nongamblers (those who had gambled or bet less than twice in their lives,  $n = 1543$ ), recreational gamblers (gamblers who did not report any problems attributable to gambling,  $n = 1250$ ), and problem gamblers (gamblers who reported at least

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**TABLE 1—Demographic Characteristics of Nongamblers, Recreational Gamblers, and Problem Gamblers from the St. Louis Epidemiologic Catchment Area Study (Wave 1: 1981)**

	Nongamblers (n = 1543)		Recreational Gamblers <sup>a</sup> (n = 1250)		Problem Gamblers <sup>b</sup> (n = 161)	
	No.	(%)	No.	(%)	No.	(%)
Mean age, y (SD)** (Range = 18–96)	44.1	(18.97)	41.4	(16.73)	36.5	(16.72)
Sex**						
Male	376	(29.5)	687	(61.7)	111	(78.2)
Female	1167	(70.5)	563	(38.3)	50	(21.8)
Race**						
African American	662	(21.4)	381	(15.2)	91	(31.0)
White <sup>c</sup>	881	(78.6)	869	(84.8)	70	(69.0)
Marital status <sup>d*</sup>						
Not divorced/separated	1241	(89.2)	1041	(91.3)	122	(85.4)
Divorced/separated	301	(10.7)	208	(8.7)	39	(14.6)
Educational status <sup>d</sup>						
No college degree	1328	(86.1)	1022	(81.9)	138	(82.6)
College degree	184	(13.9)	210	(18.1)	22	(17.4)

Note. The n's are unweighted. Percentages, chi-square analyses, and mean ages were based on weighted, clustered cases.

<sup>a</sup>Recreational gamblers were defined as individuals who did not report any gambling-related problems.

<sup>b</sup>Problem gamblers were defined as individuals who reported at least 1 gambling-related problem.

<sup>c</sup>This race category includes 3.4% American Indians, Asians, Pacific Islanders, and others.

<sup>d</sup>Data on these characteristics were missing for some respondents; therefore the numbers may not equal the n's shown, and the weighted percentages are based on the number of respondents for whom these data were available.

\* $P \leq .05$ ; \*\* $P \leq .001$ .

1 gambling-related problem,  $n = 161$ , which includes 29 gamblers who met DIS/DSM-III criteria for pathological gambling). Fifty cases were omitted because of missing data on the gambling screening question (total  $n = 2954$ ).

Prevalence rates and inferential statistics are weighted and standard error-adjusted to account for oversampling of African Americans, clustering, and nonresponse. Sample sizes shown in tables are unweighted. Chi-square tests were used to compare demographic characteristics of nongamblers, recreational gamblers, and problem gamblers. Clustered, weighted multiple logistic regression was used to estimate the likelihood that, compared with nongamblers, both recreational and problem gamblers would more likely (1) meet criteria for a psychiatric disorder, after adjustment for effects of race, sex, and age, and (2) use (and abuse or be dependent on) substances, after adjustment for effects of race, sex, age, and diagnosis of antisocial personality disorder. The Statistical Analysis System (SAS)<sup>23</sup> and Stata<sup>24</sup> were used in the analysis.

## Results

Analysis of the results produced the following weighted percentages. Half of the sample (50.7%;  $n = 1411$ ) reported placing a

bet or gambling at least twice in their lives, and 9.2% ( $n = 161$ ) of gamblers reported at least 1 gambling-related problem. The overall lifetime prevalence rate of DIS/DSM-III pathological gambling was 0.9% ( $n = 29$ ). The rate was 19.1% among problem gamblers. "Thinking I gambled too much" was the most commonly reported gambling problem, endorsed by 83.9% of problem gamblers and 100% of pathological gamblers. Nearly 40% of problem gamblers and 92.5% of pathological gamblers reported having borrowed or stolen money in order to gamble or bet. Nearly 25% of problem gamblers either were unable to pay bills or had trouble at home or work because of gambling or betting. Among pathological gamblers, 83% and 95% endorsed these items, respectively. Only problem gamblers were asked about the onset of their gambling behavior and their need for treatment. The average age of first gambling or betting heavily among problem gamblers was 21.8 years (SD = 8.72; range = 8–65). Only one of them reported discussing gambling-related problems with a doctor.

Compared with nongamblers, recreational and problem gamblers were more likely to be male (Table 1). Problem gamblers were younger and more likely than others to be separated or divorced. African Americans, compared to whites, were more likely to be

problem gamblers than recreational gamblers or nongamblers.

Table 2 gives the prevalence of DIS/DSM-III psychiatric disorders among nongamblers, recreational gamblers, and problem gamblers, with odds ratios (OR) estimating the likelihood that, compared with nongamblers, recreational gamblers and problem gamblers would meet the criteria for these disorders. Analyses showed a dose-response effect in that increasing levels of gambling severity were associated with a corresponding increase in the likelihood of meeting criteria for various psychiatric disorders. Recreational gamblers and problem gamblers had higher rates of most psychiatric disorders than nongamblers after adjustment for race, sex, and age effects. The association between gambling and antisocial personality disorder was strongest—compared with nongamblers, recreational gamblers and problem gamblers were at increased odds of meeting the diagnostic criteria for this disorder (ORs = 2.3 and 6.1, respectively). Using age-of-onset information, we found that problems with depression and phobias usually preceded gambling among problem gamblers with comorbid depression and phobias.

After adjustment for race, sex, age, and antisocial personality disorder effects, recreational and problem gambling was associated

**TABLE 2—Prevalence of and Odds Ratios for DIS/DSM-III Psychiatric and Substance Use Disorders among Gamblers and Nongamblers: St. Louis Epidemiologic Catchment Area Study (Wave 1: 1981)**

	Prevalence						Odds Ratio (95% Confidence Interval)	
	Nongamblers		Recreational Gamblers		Problem Gamblers		Recreational Gamblers vs Nongamblers	Problem Gamblers vs. Nongamblers
	No.	(%)	No.	(%)	No.	(%)		
<b>Psychiatric disorders</b>								
Manic episode	17	(0.8)	15	(1.0)	3	(3.1)	1.4 (0.4, 4.8)	3.4 (0.8, 15.1)
Major depression	95	(5.2)	95	(6.1)	15	(8.8)	1.7 (1.1, 2.6)*	3.3 (1.6, 6.8)*
Suicidalit <sup>a</sup>	28	(1.6)	24	(1.4)	6	(2.0)	1.0 (0.5, 2.3)	1.6 (0.4, 6.0)
Dysthymia	66	(3.4)	49	(4.3)	7	(4.2)	1.8 (1.0, 3.0)*	2.1 (0.8, 5.7)
Schizophrenia	15	(1.1)	12	(0.7)	6	(3.9)	0.6 (0.2, 1.8)	3.5 (1.3, 9.7)*
Obsessive-compulsive disorder	36	(2.1)	32	(1.8)	4	(0.9)	1.1 (0.5, 2.6)	0.6 (0.1, 2.9)
Panic	23	(1.6)	20	(1.3)	5	(23.3)	1.1 (0.4, 2.5)	3.2 (0.8, 12.5)
Generalized anxiety	107	(9.0)	108	(9.4)	13	(7.7)	1.2 (0.8, 1.8)	1.1 (0.5, 2.6)
Phobias	189	(9.5)	136	(8.9)	32	(14.6)	1.2 (0.9, 1.7)	2.3 (1.2, 4.3)*
Somatization "syndrome" <sup>b</sup>	97	(4.0)	85	(5.3)	18	(8.6)	1.7 (1.1, 2.8)*	3.0 (1.6, 5.8)*
Antisocial personality	85	(4.6)	172	(13.1)	64	(35.0)	2.3 (1.6, 3.4)*	6.1 (3.2, 11.6)*
<b>Substance use and substance use disorders<sup>c</sup></b>								
Alcohol use	1303	(85.3)	1206	(97.0)	157	(98.9)	3.9 (2.4, 6.3)*	7.2 (2.3, 23.0)*
Abuse/dependence	116	(6.8)	266	(22.0)	71	(44.5)	1.9 (1.3, 2.7)*	3.3 (1.9, 5.6)*
Nicotine use	737	(27.6)	840	(43.6)	123	(60.1)	1.9 (1.6, 2.4)*	2.6 (1.6, 4.4)*
Dependence	420	(58.0)	546	(64.6)	88	(76.3)	1.3 (1.0, 1.7)*	2.1 (1.1, 3.8)*
Illicit drug use <sup>d</sup>	223	(71.6)	350	(74.5)	62	(75.2)	1.0 (0.6, 1.7)	0.8 (0.3, 2.1)
Abuse/dependence	54	(23.8)	98	(26.0)	25	(39.9)	1.0 (0.5, 1.7)	1.3 (0.5, 3.3)

Note. DIS = Diagnostic Interview Schedule; DSM-III = *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed. Asterisks indicate significant odds ratios. Odds ratios are adjusted for race, sex, and age effects, using data derived from weighted, clustered logistic regression. Percentages are based on weighted cases; the No. is unweighted.

<sup>a</sup>Suicidalit<sup>a</sup> is defined as recurrent thoughts of death or suicide, wanting to die, or attempting suicide.

<sup>b</sup>Escobar's abridged somatization criteria of 4 or more symptoms for males and 6 or more symptoms for females were used.<sup>25</sup>

<sup>c</sup>The substance abuse/dependence analyses adjust for race and sex effects and antisocial personality disorder, and all abuse/dependence analyses exclude nonusers.

<sup>d</sup>Illicit drug use is defined as having used 6 or more times in lifetime, just as alcohol use is defined as ever having consumed enough alcohol to get drunk, and nicotine use is defined as ever having smoked cigarettes daily for at least 1 month.

with both substance use and increased risk for substance abuse or dependence disorders. Furthermore, among problem gamblers with alcohol abuse or dependence, gambling problems occurred within 2 years of the onset of alcoholism in 65% of the cases (32/49). Gambling problems occurred after the onset of nicotine dependence in 67% (45/67) of the cases.

## Discussion

This study found that the lifetime prevalence of pathological gambling in a St. Louis household sample was low (0.9%), but comparable to rates published earlier in Canadian and US studies.<sup>14,15,17</sup> Consistent with other studies, we found that recreational and problem gamblers were more likely than nongamblers to be male.

In terms of psychiatric comorbidity, problem gamblers were more likely than nongamblers to meet criteria for major depression, phobias, somatization "syndrome," anti-

social personality disorder, alcoholism, and nicotine dependence. Even recreational gamblers were more likely than nongamblers to meet psychiatric criteria. Other studies have also found that gamblers have increased rates of psychiatric disorders.<sup>4,9,11</sup> Information on comorbidity of problem gambling with other psychiatric disorders may be important because in this sample, problems relating to gambling activity generally followed phobias and periods of major depression. One can speculate that the excitement derived from gambling may be used to self-medicate or to escape from the stress associated with phobias and depression.

This data set did not allow for adequate hypothesis testing; however, we have enough data to alert clinicians about the importance of screening for gambling problems among persons with antisocial personality disorder, major depression, phobias, alcoholism, and nicotine dependence. Because the focus of the Epidemiologic Catchment Area Study was not gambling, the findings may be limited

in that we were constrained in the number of questions that could be asked about gambling. Because this study was fielded, the American Psychiatric Association's criteria for gambling have significantly changed to mimic those of addiction disorders.<sup>26,27</sup> We do not know whether this presents a limitation, since to our knowledge studies of the general population have not focused on the concordance between DSM-III, DSM-III-R (revised), and DSM-IV criteria.

The prevalence rates reported here reflect the level of gambling activity reported in a representative household sample of St. Louis adults interviewed in 1981. The field of public health would benefit from future research that examines gambling activity with more stringent criteria in the environmental context of increased gambling opportunities. □

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## References

- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 3rd ed. Washington, DC; American Psychiatric Association; 1980.
- Rosenthal RJ, Lorenz VC. The pathological gambler as criminal offender. Comments on evaluation and treatment. *Clin Forensic Psychiatry*. 1992;15:647-660.
- Lesieur HR, Blume SB. Characteristics of pathological gamblers identified among patients on a psychiatric admissions service. *Hosp Community Psychiatry*. 1990;41:1009-1012.
- Lesieur HR, Blume SB, Zoppa RM. Alcoholism, drug abuse, and gambling. *Alcohol Clin Exp Res*. 1986;10:33-38.
- Lesieur HR, Heineman M. Pathological gambling among youthful multiple substance abusers in a therapeutic community. *Br J Addict*. 1988;83:765-771.
- Feigelman W, Kleinman PH, Lesieur HR, Millman RB, Lesser ML. Pathological gambling among methadone patients. *Drug Alcohol Depend*. 1995;39:75-81.
- McCormick RA, Russo AM, Ramirez LF, Taber J. Affective disorders among pathological gamblers seeking treatment. *Am J Psychiatry*. 1984;141:215-218.
- Ciarrocchi J, Richardson R. Profile of compulsive gamblers in treatment: update and comparisons. *J Gambling Behav*. 1989;5:53-65.
- Elia C, Jacobs DF. The incidence of pathological gambling among Native Americans treated for alcohol dependence. *Int J Addict*. 1993;28:659-666.
- Blaszczynski AP, McCognaghy N, Frankova A. Boredom proneness in pathological gambling. *Psychol Rep*. 1990;67:35-42.
- Steinberg MA, Kosten TA, Rounsaville BJ. Cocaine abuse and pathological gambling. *Am J Addict*. 1992;1:121-132.
- Murray JB. Review of research on pathological gambling. *Psychol Rep*. 1993;72:791-810.
- Lesieur HR, Blume SB. The South Oaks Gambling Screen (SOGS): a new instrument for the identification of pathological gamblers. *Am J Psychiatry*. 1987;144:1184-1188.
- Volberg RA. The prevalence and demographics of pathological gamblers: implications for public health. *Am J Public Health*. 1994;84:237-240.
- Ladouceur R. Prevalence estimates of pathological gambling in Quebec. *Can J Psychiatry*. 1991;36:732-734.
- Ladouceur R, Dubé D, Bujold A. Prevalence of pathological gambling and related problems among college students in the Quebec metropolitan area. *Can J Psychiatry*. 1994;39:289-293.
- Bland RC, Newman SC, Orn H, Stebelsky G. Epidemiology of pathological gambling in Edmonton. *Can J Psychiatry*. 1993;38:108-112.
- Robins LN, Helzer JE, Croughan J, et al. *The NIMH Diagnostic Interview Schedule*. Version 3. Washington, DC: US Public Health Service; 1981.
- Robins LN, Helzer JE, Croughan J, et al. The NIMH Diagnostic Interview Schedule: its history, characteristics and validity. *Arch Gen Psychiatry*. 1981;38:381-389.
- Robins LN, Reiger DA, eds. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York: The Free Press; 1991.
- Leaf PJ, Myers JK, McEvoy LT. Procedures used in the Epidemiologic Catchment Area Study. In: Robins LN, Reiger DA, eds. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York: The Free Press; 1991:11-32.
- Boyd JH, Burke JD, Gruenberg EM, et al. Exclusion criteria of DSM-III: a study of co-occurrence of hierarchy-free syndromes. *Arch Gen Psychiatry*. 1984;41:983-989.
- Statistical Analysis System/STAT User Guide*. Version 6.1. Cary, NC: SAS Institute Inc; 1990.
- Stata, Version 4.0* [computer program]. College Station, Tex: Stata Corp; 1995.
- Escobar JI, Burnam A, Karno M, Forsythe A, Golding JM. Somatization in the community. *Arch Gen Psychiatry*. 1987;44:713-718.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 3rd ed., rev. Washington, DC: American Psychiatric Association; 1987.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC: American Psychiatric Association; 1994.

## Promoting Skin Cancer Prevention Counseling by Pharmacists

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### Introduction

To aid in the primary prevention of both melanoma and nonmelanoma skin cancers, US health organizations have endorsed the involvement of health professionals in promoting ultraviolet radiation (UVR) exposure reduction behaviors among the general population.<sup>1,2</sup> As one group of health professionals, pharmacists have great potential as skin cancer prevention educators because they are viewed as credible,<sup>3</sup> have the opportunity to help the patient select an appropriate sunscreen product, come into contact with large numbers of individuals, and routinely counsel patients on prescription and over-the-counter medications<sup>4-7</sup> and other health topics.<sup>8-10</sup> Results of an earlier survey conducted by our research group with a random sample of pharmacists indicated

that although willingness to offer skin cancer prevention counseling was high, actual counseling rates were low.<sup>11</sup> The randomized, controlled trial described in this paper tested the effects of a multicomponent, pharmacy-based intervention called Project *SUNWISE* on skin cancer prevention counseling rates.

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## ABSTRACT

**Objectives.** This study evaluated the effects of an intervention on rates of skin cancer prevention counseling by pharmacists.

**Methods.** Fifty-four pharmacies were randomly assigned to intervention or control conditions. Intervention consisted of training, feedback, and prompts. Counseling rates before and after the intervention were obtained from study confederates.

**Results.** At pretest, the proportions of control and intervention sites providing counseling at least once were 7.4% and 0%, respectively (NS). At posttest, these proportions were 3.7% and 66.7%, respectively ( $P < .001$ ).

**Conclusions.** The results indicated that the intervention was successful and that pharmacists can play an important role in educating the public about skin cancer prevention strategies. (*Am J Public Health*. 1998;88:1096-1099)