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Prevalence of problem gambling in Iowa: Revisiting Shaffer's adaptation hypothesis

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Abstract

BACKGROUND—Pathological gambling (PG) is an important public health problem. We assessed the prevalence of PG and problem (at-risk) gambling in a random sample of Iowa adults and compared the results to survey data collected in 1989 and 1995. The goal of this study was to examine whether continued expansion of gambling venues is associated with increased rates of problematic gambling behavior.

METHODS—A random digit dialing telephone screening was conducted in eastern Iowa of men and women age ≥18. Respondents were administered the South Oaks Gambling Screen (SOGS) to assess lifetime gambling behavior. Demographic and clinical variables were collected.

RESULTS—A total of 356 respondents (147 men, 209 women) completed the SOGS, and all reported lifetime gambling participation. PG (SOGS ≥5) was found in 5 (1.4%) and problem gambling (SOGS = 3, 4) in 8 (2.2%) respondents. Disordered gambling (SOGS ≥3) was found in 13 (3.6%) respondents. Risk factors for disordered gambling included age (odds ratio [OR] = 0.64 per 10-year age increase), income (OR = 0.82 per $10,000 increase), minority group status (OR = 5.75), number of lifetime gambling activities (OR = 1.27), and having ever gambled ≥$100 (OR = 13.3). Overall gambling participation was significantly less in the current sample, compared with data collected in 1995.

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CONCLUSIONS—Recent gambling participation was less than in 1995, despite the continued expansion of gaming opportunities. Disordered gambling was associated with younger age, lower income, and minority group status. The results are consistent with Shaffer's "adaptation" hypothesis, which posits that following an initial increase in gambling participation, problematic gambling stabilizes at a lower level.

Keywords

pathological gambling; prevalence; problem gambling; SOGS

INTRODUCTION

Gambling is a major recreational activity in the United States. Research shows that up to 90% of Americans have engaged in some form of gambling.[1] Pathological gambling (PG), the most severe form of disordered gambling behavior, is a major public health problem that is costly and associated with substance misuse, depression, domestic violence, crime, and suicide.[2–7] Categorized as an impulse control disorder in DSM-IV, PG has been recommended to be reclassified as a "behavioral addiction" in DSM-5, expected to be published in 2013 (www.dsm5.org).

The prevalence of lifetime PG in the United States has been estimated at 1% to 2%,[8] although the 2001 to 2003 National Comorbidity Survey Replication arrived at 0.6%.[9] Problem ("at-risk") gambling may be more common, with lifetime prevalence estimates from 3% to 4%.[8] Therefore, the prevalence of any type of disordered gambling (PG and problem gambling combined) may be 4% to 6% in the adult population.

Some investigators have concluded that the prevalence of disordered gambling increases as gambling opportunities expand.[10,11] A 1990 study found that the availability of a casino within 50 miles is associated with a nearly 2-fold increase in PG prevalence.[12] Lester reported that the density of Gamblers Anonymous chapters was positively associated with the availability of casinos, card rooms, slot machines, and other forms of gambling.[13]

Iowa is an ideal place to study this issue. Gambling was legalized in 1974 with the introduction of bingo. A state lottery began in 1985, and pari-mutuel wagering was introduced at dog and horse tracks in 1985 and 1989, respectively. Riverboat casinos were legalized in 1990, and the first casino opened 1 year later. Seven riverboat casinos were operating in Iowa by 1994 (personal communication, Mark Vander Linden). To monitor the presence of disordered gambling behavior, the State of Iowa commissioned prevalence studies by Volberg and Steadman in 1989[14] and by Volberg in 1995.[15]

The 1995 survey reported an increase in disordered gambling compared with 1989. PG, defined as a South Oaks Gambling Screen[16] (SOGS) score of ≥5, increased from 0.1% to 1.9%, whereas problem gambling (SOGS score of 3 or 4) increased from 1.6% to 3.5%. Volberg[15] concluded that, "… increases in the availability of gambling in Iowa (have led) to increases in the prevalence of gambling-related problems."

Since 1995, the number of casinos has increased further, and in 2005 the Iowa legislature permitted land-based casinos. There are now 21 casinos operating in Iowa, including 18 state-licensed casinos and 3 owned and operated by American Indian tribes (personal communication, Mark Vander Linden). A 2011 state-sponsored study, employing the National Opinion Research Center's DSM Screen for Gambling Problems (NODS) as the classification tool,[12] reported figures of 0.6% for lifetime PG and 0.6% for lifetime problem gambling, or 1.2% combined.[17] These data are not directly comparable to the SOGS data

published in 1989 and 1995 because the NODS is more conservative in assessing disordered gambling.[18] That said, the low rates suggest that the prevalence of disordered gambling in Iowa has not increased and may have even decreased since 1995, despite increased gambling opportunities.

We had an opportunity to examine the prevalence of disordered gambling using SOGS data collected from mid-2006 to 2008 during a family study of PG. The University of Iowa Department of Psychiatry had partnered with the Center for Social and Behavioral Research (CSBR) at the University of Northern Iowa (Cedar Falls, IA) to conduct a random telephone screening of adult Iowans. The purpose was to identify individuals without PG who could serve as control subjects. Although not strictly comparable in sampling methods used, our screening results contrast sharply with the findings of Volberg and Steadman[14] and Volberg.[15] We had expected the prevalence of disordered gambling would be greater than in 1995 because of expanded gambling opportunities.

METHODS

The CBSR telephone-based screen was conducted of randomly selected households with at least 1 resident age ≥18 between July 2006 and January 2008. The University of Iowa institutional review board approved the study. Respondents were read the consent document and gave verbal assent. The CSBR used a Computer Assisted Telephone Interviewing (CATI) system to collect the data. CSBR staff trained and supervised telephone interviewers, monitored study progress, and assessed quality control. Interviewers received formal training in interviewing skills and use of the CATI system. At the time of data collection, landline phone penetration rates in Iowa were estimated at 97% and cell phone-only households were rare.

To match the demographic characteristics of family study probands, the CBSR screened for persons who fell within specific demographic groupings by household location, age, sex, and education level. Exclusion criteria included ever having been diagnosed with psychosis or a neurologic disorder and/or having been adopted. Many potential subjects in the initial 2,827 calls were excluded for not meeting study targets or refused to participate, as is common in research recruitment.

A total of 356 participants completed the SOGS[16] to assess lifetime gambling behavior. The 20-item scale is based on DSM-III-R criteria for PG,[19] and it is generally considered the “gold standard” screener. The SOGS has shown excellent reliability and validity in a variety of groups, including hospital workers, university students, prison inmates, and inpatients in substance abuse treatment programs.[16,20,21]

We also collected data on age, sex, race/ethnicity, income, and experience with gambling. Because our family study probands with PG were primarily residents of eastern Iowa, we limited the data collection to residents in that region.

Statistical analysis

We defined PG as a SOGS score ≥5, and problem gambling as a SOGS score of 3 or 4. We compared 4 levels of gambling (SOGS scores of 0, 1 or 2, 3 or 4, ≥5) for the current study and the 1989 and 1995 Iowa studies. These are comparisons of overall gambling participation, as all 4 gambling levels are considered simultaneously. We also compared the proportions of respondents with PG (SOGS ≥5) and any disordered gambling (SOGS ≥3) for the current study and the 1989 and 1995 studies. Pearson chi-square tests were used to test for differences between studies.

Risk factors for disordered gambling were examined by testing the association of each factor with having a SOGS score ≥3. Logistic regression was used for dimensional risk factors, including age, annual income, number of gambling activities, and largest amount ever wagered. Odds ratio (OR) point estimates and 95% CI provide the test of association for the dimensional variables. Pearson's chi-square test (or Fisher exact test when cell sample sizes were small) was used for dichotomous and categorical risk factors. *P* values from the chi-square or Fisher exact tests provide the test of association for categorical variables.

Fisher exact test was used to test the association between different types of gambling activities and disordered gambling. The associations of types of gambling activities and disordered gambling were examined by testing whether ever participating in each activity was associated with problem gambling. A significance level of 0.05 was used for all analyses.

RESULTS

Data were collected from 356 respondents, including 147 men (41%) and 209 women (59%) (TABLE 1). Consistent with Iowa's population, the sample was predominantly white (94%), with 10 (3%) African American respondents and 10 (3%) of another race/ethnicity. Mean age was 48.2 years (standard deviation [SD] = 14.7). Educational attainment was distributed as at least a bachelor's degree (32%), some college but less than a 4-year degree (43%), high school or general education development diploma (21%), and less than a high school education (3%). On average, respondents reported participating in a mean of 4.1 types of gambling activities (SD = 3.3). Younger age was associated with disordered gambling.

Neither sex nor educational attainment was significantly related to disordered gambling. Respondents having ever wagered ≥$100 were more likely to be problem or pathological gamblers (OR = 13.3, $P < .001$). Minority group members were more likely to meet criteria for disordered gambling ($P = .030$). Three of the 20 minority group respondents (15%) were disordered gamblers, compared with 3% of the white respondents. For each 10-year age increase, the OR for disordered gambling was 0.64 (95% CI [0.42, 0.97]). For each $10,000 increase in annual income, the odds ratio for disordered gambling was 0.82 [0.67, 1.00]. Number of gambling activities participated in was related to disordered gambling (OR = 1.27; [1.13, 1.43]). The types of gambling activities that had the strongest associations with disordered gambling ($P < .01$) included card games, bingo, outcomes of sports events with acquaintances, and pull-tabs (data not shown).

Overall gambling participation in the current study was less than in the 1995 study, as the Pearson chi-square test comparing SOGS scores was statistically significant (TABLE 2, $\chi^2 = 18.7$, $df = 3$, $P < .001$). Relative to respondents in the 1995 study, respondents in the present study were less likely to have PG (1.4% vs 1.9%), problem gambling without PG (2.2% vs 3.5%), and non-problem recreational gambling (SOGS = 1, 2) (13.5% vs 22.9%). SOGS scores in the present study were more similar to those from the 1989 study (Fisher exact test $P = .039$).

Prevalence of disordered gambling was not significantly different between the 1995 study (5.4%) and the present study (3.6%) (TABLE 3, $\chi^2 = 1.8$, $df = 1$, $P = .176$) but was significantly different between the 1989 study (1.7%) and the present study ($\chi^2 = 3.9$, $df = 1$, $P = .049$). Prevalence of PG was not significantly different between the 1995 study (1.9%) and the present study (1.4%) ($\chi^2 = 0.4$, $df = 1$, $P = .528$), but was significantly different between the 1989 study (0.1%) and the present study (Fisher exact test $P = .015$).

DISCUSSION

The random screening sample used in the present study showed that disordered gambling is common among adult Iowans. Although our data collection goals and methods in 2006 to 2008 differed from those of Volberg in 1995, a comparison of the 2 surveys' data found that the prevalence of PG and problem gambling did not increase over time. In fact, rates in our study are lower in comparison, despite the continued expansion of gambling venues in Iowa. Risk factors identified for disordered gambling are consistent with the literature and include younger age, minority group status, lower income levels, and ever having gambled ≥ $100.[9,22] In this study, family gambling history was not associated with disordered gambling, but no systematic attempt was made to ascertain family history.

Whereas some researchers have argued that PG prevalence will increase along with increased gambling availability, Shaffer[23] argues that gambling problems will initially increase and then stabilize. Shaffer and Martin[24] posit that individuals adapt relatively quickly following exposure to gambling, and the prevalence of PG only increases in the short term after the introduction of new gambling opportunities. In describing the *adaptation hypothesis*, Shaffer[23] points out that "…after the novelty of initial exposure, people gradually adapt to the risks and hazards associated with potential objects of addiction" (pp. 1228-1229). He and colleagues point to Nevada,[23] a state that has very high rates of exposure to gambling but does not show proportionately more gambling-related problems than other states. Nevada is described as a more "mature" gambling setting than more recent settings such as Iowa. The data we report here are consistent with Shaffer's hypothesis.

Several limitations need to be acknowledged. First, our study was opportunistic because the data were collected while recruiting controls for an unrelated family study of PG. It was not designed as a survey to be generalized to the state population. Second, the interview script included screening questions that excluded persons who acknowledged a past psychosis, neurologic disorder, or being adopted. Therefore, not all persons contacted were eligible to complete the SOGS. Third, the relatively small number of participants limits our study's statistical power. Fourth, although drawing comparisons with the 1989 and 1995 data seems appropriate, those surveys were developed to recruit representative samples of adult Iowans and ours was not. Finally, the data involve adults and not youth, so we are unable to comment on the prevalence of disordered gambling in Iowans age <18.

CONCLUSIONS

Despite these limitations, the current findings are consistent with Shaffer's adaptation hypothesis of 2005. They suggest that rates of PG and problem gambling may be lower in Iowa now than in the past, despite expanded gambling venues in the state. Future research to replicate the earlier methods using standard survey methods is needed to confirm the finding.

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TABLE 1

Demographic and clinical characteristics in 356 respondents in Iowa study, 2006 to 2008

Variable	PG/Problem (n = 13)		Others (n = 343)		χ^2	*P*	OR	CI
	Mean	SD	Mean	SD				
Age, years	39.6	11.3	48.6	14.8	4.4	.036	0.64[a]	0.42, 0.97
Largest amt. ever gambled	198.5	733.2	397.7	237.8	0.9	.354	1.02[b]	0.98, 1.07
Income, annual in $1,000s	38.5	28.3	60.4	40.6	3.8	.050	0.82[c]	0.67, 1.00
No. of gambling activities	8.2	3.2	4.0	3.2	15.8	<.001	1.27	1.13, 1.43
	n	%	**n**	%				
Sex					**0.1**	**.717**		
Female	7	3.3%	202	96.7%				
Male	6	4.1%	141	95.9%			1.23	0.40, 3.73
Race/ethnicity								
White	10	3.0%	326	97.0%				
African American	2	20.0%	8	80.0%				
Other	1	10.0%	9	90.0%				
Minority	3	15.0%	17	85.0%		.030[d]	5.75	1.45, 22.9
Educational attainment						**.128** [d]		
< High school	2	16.7%	10	83.3%		.066[d]	6.06	1.18, 31.0
High school/GED	2	2.6%	74	97.4%				
< 4 years college	4	2.6%	150	97.4%				
> Bachelor's degree	5	4.4%	109	95.6%				
Largest amt. ever gambled						**<.001** [d]		
<$100	4	1.4%	290	98.6%				
≥$100	9	15.5%	49	84.5%			13.3	3.95, 44.9
Family gambling history						**.163** [d]		
Yes	3	7.7%	36	92.3%			2.53	0.67, 9.63

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Variable	PG/Problem (n = 13)		Others (n = 343)		χ^2	*P*	OR	CI
	Mean	SD	Mean	SD				
No	10	3.2%	304	96.8%				

GED: general educational development; OR: odds ratio; PG: pathological gambling; SD: standard deviation.

[a] Odds ratio for each 10-year age increase.

[b] Odds ratio for each $100 increase in largest amount gambled.

[c] Odds ratio for each $10,000 increase in annual income.

[d] Fisher exact test.

TABLE 2

Lifetime gambling behavior of respondents to 3 surveys, n (%)

Gambling level	Survey		
	1989 (n = 750)	1995 (n = 1,500)	Current (n = 356)
SOGS ≥5 (pathological gambling)	1 (0.1 %)	28.5[a] (1.9%)	5 (1.4%)
SOGS = 3, 4 (problem gambling)	12 (1.6%)	52.5[a] (3.5%)	8 (2.2%)
SOGS = 1,2	89 (11.9%)	343.5[a] (22.9%)	48 (13.5%)
SOGS = 0	648 (86.4%)	1,075.5[a] (71.7%)	295 (82.9%)
Any disordered gambling (SOGS ≥3)	13 (1.7%)	81 (5.4%)	13 (3.6%)

SOGS: South Oaks Gambling Screen.

[a]1995 study provided percentages but not actual counts; these authors estimated actual counts within 0.5 from the percentages.

TABLE 3

Statistical comparisons of lifetime gambling rates across studies

Study/comparison	χ^2	*df*	*P*	OR	CI
Current vs 1989					
PG (SOGS ≥ 5)			.015[a]	10.7	1.24, 91.7
Any disordered gambling (SOGS ≥3)	3.9	1	.049	2.15	1.00, 4.68
Overall level of gambling participation			.039[a]		
Current vs 1995					
PG (SOGS ≥ 5)	0.4	1	.528	0.74	0.28, 1.92
Any disordered gambling (SOGS ≥3)	1.8	1	.176	0.66	0.37, 1.21
Overall level of gambling participation	18.7	3	<.001		

OR: odds ratio; PG: pathological gambling; SOGS: South Oaks Gambling Screen.

[a]Fisher exact test.