A Cross-Sectional Study of Problem and Pathological Gambling in Patients With Schizophrenia/Schizoaffective Disorder

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Background: Community data suggest frequent co-occurrence between schizophrenia/ schizoaffective disorder and problem gambling. However, gambling behaviors in large samples of patients with schizophrenia/schizoaffective disorder have not been systematically examined to date.

Method: A sample of outpatient subjects (N = 337) diagnosed with either schizophrenia or schizoaffective disorder and who were treated in either the VA Connecticut Healthcare System or the Connecticut Mental Health Center was interviewed in order to examine the prevalence estimates and clinical correlates of problem and pathological gambling. Multinomial logistic regression models investigated clinically relevant measures in recreational or problem/pathological gamblers, as compared to nongamblers. Data were collected between June 2002 and November 2003.

Results: Sixty-five participants (19%) met criteria for past-year problem/pathological gambling, with 10% meeting criteria for pathological gambling. Significant correlates of problem and pathological gambling from multivariable models included greater alcohol use severity (P=.007), higher depression scores (P=.04), and more outpatient mental health care utilization (P=.03). Participants with problem/pathological gambling were more likely than recreational gamblers to gamble for excitement, gamble more frequently and heavily, and report either sports or card gambling as favorite.

Conclusions: A substantial proportion of individuals in treatment for psychotic disorders report past-year gambling problems. Patients with co-occurring alcohol use problems and depression may be at particularly high risk. These findings suggest the need for improved prevention and treatment efforts related to problem/pathological gambling in individuals with psychotic disorders.

J Clin Psychiatry 2009;70(9):1250–1257 © Copyright 2009 Physicians Postgraduate Press, Inc.

hile 86% of American adults report gambling at least once in their lives,¹ most gamble only occasionally and without negative consequences. However, for some, gambling results in large monetary losses, disruption of work and family life, bankruptcy, and even suicide.²⁻⁴ It has been estimated that up to 5% of the general U.S. population suffers from problem or pathological gambling,^{5,6} although more recent studies suggest lower prevalence estimates.^{7,8} Epidemiologic data suggest that pathological gamblers are more likely to be male,^{5,9} younger,⁵ and possibly of lower socioeconomic status.¹⁰ Several studies have suggested frequent co-occurrence between psychiatric disorders and disorders of impaired impulse control, including pathological gambling.¹¹⁻¹⁴ The St. Louis site of the Epidemiologic Catchment Area study, a community study, found that both recreational gamblers and problem gamblers were more likely than nongamblers to suffer from psychiatric disorders,¹³ and an odds ratio of 3.5 was reported between problem/pathological gambling and schizophrenia. Additionally, Grant and colleagues¹⁴ found elevated rates of all impulse control disorders, including a prevalence rate of pathological gambling of about 7%, in a sample of psychiatric inpatients, including those with psychotic disorders. Several case reports have also described problem or pathological gambling in individuals with psychotic disorders.^{15,16} However, a systematic examination of gambling behaviors and their clinical correlates in individuals in outpatient treatment of psychotic disorders has not been previously described. Problem and pathological gambling are associated with arrest, incarceration, suicidality, co-occurring psychiatric disorders, and other adverse health measures in community samples,^{17,18} and these associations persist to a lesser extent among recreational gamblers.^{19,20} Taken together, these data suggest that an improved understanding of recreational and problem/pathological gambling behaviors among psychotic patients is needed to better understand the clinical impact of specific levels of gambling within individuals in treatment of psychotic disorders.

This report presents data from a study of the frequency and clinical correlates of problem and pathological gambling among patients in treatment for schizophrenia/ schizoaffective disorder. We hypothesized the following: (1) problem/pathological gambling would be found more frequently in this patient population than in the general population; (2) problem/pathological gambling would be associated

Submitted: May 7, 2008; accepted September 26, 2008. Online ahead of print: June 16, 2009 (doi:10.4088/JCP.08m04359). Corresponding author: Rani A. Desai, PhD, MPH, Northeast Program Evaluation Center, VA Connecticut Healthcare System (182), 950 Campbell Ave, West Haven, CT 06516 (Rani.Desai@yale.edu).

with adverse measures of functioning in legal and clinical domains, and among the latter, in measures of psychosis and nonpsychotic mental health and substance abuse measures; and (3) similar to samples without schizophrenia/ schizoaffective disorder, problem/pathological and recreational gamblers in this study would report differences with respect to clinical associations and patterns of gambling.

METHOD

Data were obtained from face-to-face structured interviews with a sample of patients diagnosed with schizophrenia or schizoaffective disorder and in treatment at either the Connecticut Mental Health Center or the VA Connecticut Healthcare system. Subjects were identified through administrative patient rosters, and study staff contacted clinicians to confirm the diagnosis of schizophrenia or schizoaffective disorder and to assess the client's interest in participation. If interested, clients gave written informed consent and were paid \$15 for their participation. The study design was approved by both the Yale Human Investigation committee and the VA. The response rate was 80.6%. Data were collected between June 2002 and November 2003.

Interviews generally lasted between 1 and 1.5 hours and included information on sociodemographic characteristics, housing, social support, and functioning. Widely used, validated measures, including the Positive and Negative Syndrome Scale (PANSS),²¹ the Center for Epidemiologic Studies-Depression scale (CES-D),²² the Addiction Severity Index (ASI)²³ for drugs and alcohol, and the Diagnostic Interview Schedule (DIS)²⁴ assessment for nicotine dependence, were used to assess clinical symptoms. Gambling behaviors were assessed using items from the Gambling Impact and Behavior Study (GIBS), a national populationbased study of gambling in the US.1 The GIBS items that were utilized included types of games played, frequency of gambling, amounts of money won and lost playing each type of game, earliest age gambled, highest wins and losses, motivations for gambling, and whom respondents usually gambled with.

The primary dependent variable of interest was gambling-related problems as assessed on the National Opinion Research Center (NORC) Diagnostic Screen (NODS), an instrument that has been found to be valid and reliable.¹ The instrument assesses DSM-IV criteria for pathological gambling including tolerance, withdrawal, and impairment in family or social functioning as a result of gambling. Individuals who reported never having gambled more than 5 times in a given year were categorized as non-gamblers. As in prior studies,^{1,25,26} NODS scores were used to categorize gamblers into recreational (NODS = 0-2) and problem/pathological (NODS = 3+) gamblers (PPGs).

Correlates examined included sex, age, education, income, race/ethnicity, employment, marital status, and

homelessness in the previous 12 months; whether respondents had ever been arrested or incarcerated or threatened to injure others in the past year; suicidal ideation and attempts in the past year; what kinds of social activities respondents had engaged in in the previous month and how often; outpatient psychiatric visits, past-month mental health visits, and emergency department use; ASI scores for both illegal drugs and alcohol; PANSS scores for negative and positive schizophrenia/schizoaffective disorder symptoms; CES-D scores for depression; and a DSM-IV diagnosis of nicotine dependence. All data were self-reported.

Data analysis proceeded in several steps. First, the sample was divided into nongamblers, recreational gamblers, and those with problem/pathological gambling. Second, the 3 groups were compared on all of the covariates listed above using χ^2 tests for categorical correlates and F tests for continuous correlates. Third, a multinomial logistic regression model examined the correlates adjusted for each other; the full model was reduced to the variables that either were statistically significant or appeared to exert a confounding effect on other variables in the model. Adjusted odds ratios were presented that compared both recreational and PPGs to nongamblers. Finally, recreational and problem/ pathological gamblers were compared on the characteristics of their gambling, such as motivations for gambling, age at onset, frequency of playing, largest wins and losses, and favorite types of games using χ^2 tests for significance.

RESULTS

Three hundred thirty-seven participants completed the interview process. One hundred fifty-five (46.0%) of the participants were categorized as nongamblers; 117 (34.7%) were categorized as recreational gamblers; and 65 (19.3%) were categorized as PPGs. This frequency of problem/pathological gambling is conservatively estimated at approximately 4 times that in the general population.^{5,6} Of those with problem/pathological gambling, 33 (50.8%) met the threshold for pathological gambling, representing 9.8% of the entire sample. A χ^2 test of the association between gambling groups and diagnosis did not indicate a significant relationship between primary diagnosis (schizophrenia versus schizoaffective disorder) and gambling group (*P*=.33).

Table 1 presents the bivariate associations between sociodemographic characteristics and gambling groups. Unlike the general population, in which men and younger respondents were more likely to be PPG,⁹ sex and age measures were similar across gambling groups. There were also no differences across race/ethnicity, income, employment, homelessness, or years of education. However, marriage distinguished the groups, with a large proportion of the PPG group acknowledging never having been married.

Table 2 presents the unadjusted clinical characteristics of the 3 groups. The most statistically significant findings were observed for measures of arrest (P<.002) and

	Nongambler	Recreational	Problem/Pathological		
Variable	$(n=155)^{a}$	Gambler $(n = 117)^a$	Gambler $(n=65)^a$	χ^2 or F	Р
Race/ethnicity				$\chi^2 = 7.63$.267
White/Asian	86 (55.5)	71 (60.7)	34 (52.3)		
Black	56 (36.1)	42 (35.9)	27 (41.5)		
Hispanic	7 (4.5)	1 (0.9)	4 (6.2)		
Other	6 (3.9)	3 (2.6)	0 (0.0)		
Sex					
Female	49 (31.6)	29 (24.8)	18 (27.7)	$\chi^2 = 1.55$.461
Age, mean (SD), y	47.70 (11.27)	46.89 (11.80)	45.17 (8.67)	F=1.20	.300
Single	85 (54.8)	53 (45.3)	44 (67.7)	$\chi^2 = 8.52$.014
Living in own house or apartment	88 (56.8)	75 (64.1)	33 (50.8)	$\chi^2 = 3.28$.194
No employment	124 (80.0)	96 (82.1)	51 (78.5)	$\chi^2 = 0.37$.830
Education, mean (SD), y	12.64 (2.48)	12.32 (2.09)	11.86 (2.63)	F=2.52	.082
Income, mean (SD), \$	3,847.94 (16,154.03)	1,244.09 (1,245.07)	2,702.48 (12,586.21)	F = 1.44	.238

Table 2. Clinical and Functioning Measure Characteristics of a Sample of People With Schizophrenia/Schizoaffective Disorder, by Gambling Group

Variable	Range	Nongambler $(n - 155)^{a,b}$	Recreational Gambler $(n - 117)^{a,b}$	Problem/Pathological Gambler $(n - 65)^{a,b}$	v^2 or F	P
Lagal/violence	Itunge	(11-100)		Guilloler (II = 00)		1
A resolted		Q1 (52 2)	92 (70.1)	47 (72.2)	$v^2 - 12.45$	002
Error in concentral		51(32.3)	52 (70.1)	47 (72.3)	$\chi = 12.43$.002
Ever incarcerated		54 (34.8)	53 (45.3)	37 (57.8)	$\chi^{2} = 10.20$.006
Threatened to injure other, past y		13 (8.4)	5 (4.3)	10 (15.6)	χ=6.96	.031
Social functioning, past mo, mean (SD)					2	
Had fun, went shopping, ate out	0-4	3.05 (1.02)	3.07 (0.99)	3.18 (0.93)	$\chi^2 = 0.47$.628
Participated in activities with friends	0-4	1.90 (1.38)	1.92 (1.31)	1.77 (1.21)	$\chi^2 = 0.31$.732
Planned activity with somebody else	0-4	1.38 (1.35)	1.70 (1.24)	1.58 (1.26)	$\chi^2 = 2.14$.119
Spent time with significant other	0-4	1.10 (1.63)	1.56 (1.69)	1.66 (1.64)	$\chi^2 = 3.82$.023
Visited somebody	0-4	1.59 (1.33)	1.90 (1.32)	1.83 (1.41)	$\chi^2 = 1.87$.155
Suicidality						
Thought of hurting/killing self, past y		26 (16.8)	26 (22.2)	13 (20.3)	$\chi^2 = 1.32$.518
Attempted to hurt/kill self, past y		9 (5.8)	6 (5.1)	2 (3.2)	$\chi^2 = 0.66$.719
Mental health utilization, past mo		. ,			<i>n</i>	
≥ 1 Psychiatrist, clinician, therapist visit		131 (84.5)	107 (91.5)	62 (95.4)	$\chi^2 = 6.62$.037
\geq 1 Emergency mental health visit		12 (7.8)	19 (16.2)	5 (7.8)	$\chi^2 = 5.66$.059
Clinical measures			· · · ·		K	
ASI alcohol score, mean (SD)	0-1	0.06 (0.12)	0.08 (0.12)	$0.12^{*}(0.02)$	F=4.35	.014
ASI drug score, mean (SD)	0-1	0.02 (0.05)	0.03 (0.06)	0.04** (0.07)	F=2.99	.051
CES-D score, mean (SD)	0-60	22.94 (12.27)	23.84 (12.07)	27.70** (9.35)	$\chi^2 = 3.82$.023
DIS tobacco dependence (ves/no)		83 (53.5)	76 (65.0)	44 (67.7)	$\chi^2 = 5.49$.064
PANSS score, mean (SD)					λ	
Total	1 - 7	2.50 (0.58)	2.34 (0.50)	2.46 (0.48)	F=2.76	.065
Positive symptoms	1-7	2.46 (0.68)	2.34 (0.63)	2.42(0.08)	F = 1.17	.313
Negative symptoms	1–7	2.67 (0.79)	2.47 (0.66)	2.58 (0.61)	F=2.58	.077

^aAll data are presented as N (%) unless otherwise noted.

^bBecause of missing data, percentages may not be calculated from baseline *ns* in every category.

* $P \leq .01$ for pairwise comparison with nongamblers.

** $P \le .05$ for pairwise comparison with nongamblers.

Abbreviations: ASI = Addiction Severity Index, CES-D = Center for Epidemiologic Studies Depression Scale, DIS = Diagnostic Interview Schedule,

PANSS = Positive and Negative Syndrome Scale.

incarceration (P<.006). In both cases, nongamblers had the lowest proportions of acknowledgment and the PPG group had comparable or higher proportions as compared to recreational gamblers (Table 2). Similarly, participants in the PPG group had the highest frequency of threatening behavior (P=.03), were more likely to have used mental health services in the previous month (P=.04), had significantly higher ASI alcohol scores (P=.01), and had the highest CES-D depression scores (P=.02). Measures of social activity are also included in Table 2, indicating that PPGs reported spending more time with a significant other in the previous month (P=.02).

Table 3 presents the results of the multinomial logistic regression model examining gambling group membership. This model was the final model obtained after removing variables that were statistically nonsignificant and that also did not exert a confounding effect on other variables in the model. After other factors were adjusted for, women

	Recreational Gamblers			Problem/Pathological Gamblers		
Variable	OR ^a (95% CI)	Wald	Р	OR ^a (95% CI)	Wald	Р
Age, y	0.98 (0.95 to 1.00)	3.62	.057	0.98 (0.94 to 1.01)	2.21	.137
Gender (ref=female)	2.00 (1.10 to 3.61)	5.19	.023	1.67 (0.77 to 3.63)	1.69	.194
Single (ref=not single)	0.74 (0.42 to 1.30)	1.13	.289	2.04 (0.98 to 4.17)	3.65	.056
Negative symptoms psychosis (PANSS)	0.58 (0.39 to 0.86)	7.44	.006	0.61 (0.37 to 1.02)	3.60	.058
Alcohol abuse/dependence (ASI)	1.10 (0.88 to 1.37)	0.64	.424	1.42 (1.10 to 1.83)	7.39	.007
Depression (CES-D)	1.01 (0.98 to 1.03)	0.38	.541	1.03 (1.00 to 1.07)	4.42	.035
Any outpatient mental health visit, past mo (ref = none)	2.27 (1.00 to 5.26)	3.84	.050	5.56 (1.20 to 2.50)	4.83	.028
Any emergency mental health visit, past mo (ref = none)	2.08 (0.88 to 5.00)	2.78	.095	0.63 (0.19 to 2.04)	0.60	.438
Threatened to injure other, past y (ref = did not threaten)	0.36 (0.12 to 1.11)	3.14	.077	1.08 (0.38 to 3.03)	0.02	.894
Spent time w/significant other, past mo (ref=no)	1.16 (0.99 to 1.16)	3.38	.066	1.31 (1.07 to 1.59)	6.95	.008

Table 3. Multinomial Logistic Regression Models of the Association Between Gambling and Demographic and Clinical Characteristics

^aOdds ratio represents the association between variable and gambling group, with nongamblers as the reference group. Abbreviations: ASI = Addiction Severity Index, CES-D = Center for Epidemiologic Studies Depression Scale, OR = odds ratio, PANSS = Positive and Negative Syndrome Scale.

in the sample were more likely to be recreational gamblers (OR = 2.0, P = .02) but equally likely to be PPG compared to men. Those with higher negative symptoms on the PANSS were significantly less likely to be recreational gamblers (OR = 0.58, P = .006) and tended to be less likely to be PPG, although this finding did not reach statistical significance (P=.06). Those who had higher alcohol scores on the ASI were not more likely to be recreational gamblers but were more likely to be PPG (OR = 1.4, P = .007). Similarly, those with higher depression scores on the CES-D were not more likely to be recreational gamblers, but were more likely to be problem/pathological gamblers (OR = 1.03, P = .04). Both groups of gamblers were significantly more likely than nongamblers to report at least one outpatient mental health visit in the previous month. Finally, the PPG group was significantly more likely to report spending time with a significant other in the previous month (OR = 1.3, P = .008).

In the subsample of those reporting any gambling, the PPG group differed from recreational gamblers in their patterns of gambling (Table 4). They were more likely to report gambling for excitement (P < .001) and to have started gambling before age 18 (P = .04). They gambled on average a greater number of days in the previous year (mean of 144 days compared to 40 days for recreational gamblers, P < .001). They were more likely to place large bets (P = .001) and more likely to have wins (P = .005) or losses of \$500 or more (P < .001). Finally, they were less likely to report lottery as their favorite type of game and more likely to endorse card gambling or betting on sports as their favorite (P = .001).

DISCUSSION

Summary

This study is the first to examine the patterns of gambling behavior and clinical correlates of recreational and problem/pathological gambling among individuals in outpatient treatment of schizophrenia/schizoaffective disorder. The data indicate that patients with schizophrenia/ schizoaffective disorder may be at particularly high risk for problem and pathological gambling. The prevalence estimate reported here is approximately 4-fold higher than those reported in community studies that utilize screening instruments, and approximately 15- to 20-fold higher than in studies using DSM-based criteria.^{1,19} Thus, our findings are consistent with findings from community samples in which increased odds of problem gambling have been reported among people with schizophrenia/schizoaffective disorder.¹³

The data identified several important health and functioning correlates of gambling in this sample. First, some differences observed in general population samples (eg, higher estimates of problem/pathological gambling in males and younger respondents) are not seen here, suggesting that the protective effects of gender and age may not operate among patients with schizophrenia/schizoaffective disorder. Other factors that in population samples are often associated with more severe gambling problems, such as suicidal ideation, suicide attempts, and nicotine addiction, are not associated with the gambling group in this sample of people with schizophrenia/schizoaffective disorder. This lack of association may be due to higher base rates of these factors among people with schizophrenia/schizoaffective disorder in general, making them less salient for distinguishing gambling groups from each other.

Second, an association was observed with alcohol use problems, suggesting a potentially important pattern of comorbidity that is consistent with findings within nonpsychotic groups.^{27,28} We also find associations with depression, social relationships (as defined by spending time with a significant other), and higher utilization of mental health treatment (as measured by outpatient visits in the previous month). Third, we found an association in unadjusted analyses between rates of legal problems (arrest, incarceration, and threatening behavior) and more severe gambling problems that did not persist in multivariable models. It is possible that there were other factors that confounded the unadjusted association, such as alcohol use/

	Recreational	Problem/Pathological		
Characteristic	Gambler $(n = 117)^{a,b}$	Gambler $(n=65)^{a,b}$	χ^2 or t	P
Reasons for gambling				
Gambling for social activity	19 (16.2)	15 (28.8)	$\chi^2 = 3.56$.065
Gambling for service from staff	11 (9.4)	10 (19.2)	$\chi^2 = 3.20$.082
Gambling to be around people	20 (17.1)	16 (30.8)	$\chi^2 = 4.07$.066
Gambling for excitement	47 (40.2)	43 (82.7)	$\chi^2 = 26.15$.000
Gambling to win money	92 (78.6)	44 (84.6)	$\chi^2 = 0.82$.408
Patterns of gambling				
Age at onset of gambling				
Before age 18 y	26 (22.2)	24 (37.5)	$\chi^2 = 4.83$.037
Frequency of gambling, last y				
Total days gambled, mean (SD)	40.21 (77.87)	144.13 (173.83)	t = -4.13	.000
Most ever gambled/d, \$			$\chi^2 = 14.81$.001
<100	84 (72.4)	30 (46.2)		
100-500	27 (23.3)	24 (36.9)		
> 500	5 (4.3)	11 (16.9)		
Largest win ever/d, \$			$\chi^2 = 10.70$.005
<100	66 (57.4)	21 (32.3)		
100-500	28 (24.3)	23 (35.4)		
> 500	21 (18.3)	21 (32.3)		
Largest loss ever/d, \$			$\chi^2 = 21.79$.000
<100	92 (79.3)	32 (49.2)		
100-500	21 (18.1)	21 (32.3)		
> 500	3 (2.6)	12 (18.5)		
Favorite type of gambling			$\chi^2 = 17.66$.001
Lottery ^c	67 (59.3)	24 (38.7)		
Sports ^d	6 (5.3)	13 (21.0)		
Cards ^e	10 (8.8)	12 (19.4)		
Machine ^f	20 (17.7)	11 (17.7)		
Other ^g	10 (8.8)	2 (3.2)		

Table 4. Comparison of Recreational and Problem/Pathological Gamblers on Gambling Characteristics

^aAll data are presented as N (%) unless otherwise noted.

^bBecause of missing data, percentages may not be calculated from baseline *n*s in every category.

'Includes instant lottery games, lottery games, and pull-tabs.

^dIncludes betting on the outcome of sports events with acquaintances, sports pools, pari-mutuel sports, off-track betting on pari-mutuel sports, book-type games, and games of skill (bowling, pool, darts, etc).

*Includes card games and general table games.

^fIncludes slot machines and video machine games.

Includes dice, roulette, live keno, bingo, charitable games, and Internet gambling

abuse or other factors that reflect or are correlated with impaired impulse control.

Problem/Pathological Gambling in People With Schizophrenia/Schizoaffective Disorder

People who suffer with schizophrenia/schizoaffective disorder may be particularly vulnerable to experiencing gambling-related problems for several reasons. First, the cognitive disturbances associated with schizophrenia/ schizoaffective disorder may make it difficult for patients to control their gambling behavior, to understand the risks associated with gambling, and/or to understand the potential negative consequences of gambling. Psychotic individuals with problem/pathological gambling, as compared to those who were gambling recreationally, were more likely to endorse strategic games as their favorite (certain types of card games, sports). Strategic forms of gambling are those in which skill and knowledge lend a true advantage to the gambler. It is possible that symptoms such as delusions, hallucinations, or disorganized thinking could affect the ability of people with schizophrenia/schizoaffective disorder to win

at such games and place them at higher risk for developing gambling problems. Conversely, the finding that positive PANSS scores were not associated with problem and pathological gambling suggests that positive symptoms may not be as central as other factors in contributing to gambling problems in this population.

Although the total PANSS scores were not associated with a gambling group in these data, scores on the negative symptom scale distinguished the groups. Individuals experiencing more negative symptoms were less likely to be recreational gamblers, and the association with problem/pathological gambling tended in the same direction, although it was not statistically significant. Negative symptoms include those factors—such as social isolation, emotional withdrawal, and lack of motivation to do anything—that may keep a person from avoiding all gambling, particularly if gambling would involve going out into the community and/or interacting with other people.

A second mechanism for an association between problem/ pathological gambling and schizophrenia/schizoaffective disorder is the fact that both disorders share elements of impaired impulse control, particularly with respect to alcohol- and substance-related disorders that also have high rates of co-occurrence with pathological gambling.²⁹⁻³² In these data, higher alcohol ASI scores were associated with an increased likelihood of being in the problem/ pathological group, a finding consistent with patterns of cooccurring disorders in nonpsychotic groups.^{33,34} Clinically, this finding is important, because co-occurring addictions can complicate treatment of schizophrenia/schizoaffective disorder itself, and because, even if patients are in recovery from one addictive behavior (eg, alcoholism), they may be vulnerable to substituting another (eg, problem gambling). Finally, it is possible that multiple addictions exert a multiplicative effect on people with schizophrenia/schizoaffective disorder, so that the impairment resulting from one addiction is magnified in the presence of another. Regardless of the etiology, these results suggest that clinicians be aware of gambling as a potentially addictive behavior in patients with schizophrenia/schizoaffective disorder and screen for gambling-related problems.

A third possible mechanism may involve associated clinical features that link schizophrenia/schizoaffective disorder and problem gambling. For example, our results showed significantly higher depression scores among problem and pathological gamblers than among nongamblers. This is consistent with other community data on comorbidity between gambling and other disorders.^{19,20} Depressive symptoms may increase vulnerability to gambling problems if people are gambling in order to make themselves feel better, to relieve stress, or to avoid affective symptoms. Conversely, gambling problems may lead to depressive symptoms due to the financial and social stress of the disorder. Future studies should examine if these relationships are different (eg, stronger) for those with schizophrenia/schizoaffective disorder than for those without.

Illegal Behaviors and Violence, Mental Health Utilization, and Social Functioning

In bivariate analyses, those with problem/pathological gambling had significantly higher rates of arrest, incarceration, and threatening behavior. These findings are consistent with findings from PPG respondents who do not have a psychotic illness, but they warrant further study. While a number of studies have challenged the stereotypes that people with schizophrenia/schizoaffective disorder are more violent than others, other data indicate that people with both schizophrenia/schizoaffective disorder and other impulse control issues have increased rates of violence and interactions with the criminal justice system.^{35–37} These data further suggest that impulse control issues may manifest in complex, interrelated ways in people with schizophrenia/ schizoaffective disorder, involving alcohol and drug use, gambling, violence, and illegal behavior. The finding that illegal and violent behaviors did not appear in the final multivariable model suggests that they may be accounted

for in the model by other impulse control measures, such as ASI alcohol scores. Further research is warranted to determine the specific relationships between these domains in individuals with schizophrenia/schizoaffective disorder, and whether the types and patterns of illegal behavior exhibited by people with problem/pathological gambling differ in people with and without psychotic disorders. These results also indicate the clinical relevance of screening for problem/pathological gambling as a potential indicator of impaired impulse control over violent or illegal behaviors in individuals in treatment for schizophrenia/schizoaffective disorder.

Higher utilization of outpatient mental health resources was associated with both recreational and problem/ pathological gambling. These findings could represent better engagement in treatment, greater severity of illness, or both. Given the cross-sectional nature of these data, it is not possible to determine which of these hypotheses (or others) may be most accurate. However, findings highlight the likelihood that patients with schizophrenia/schizoaffective disorder who also gamble may be coming into contact with mental health providers more frequently than nongamblers, increasing the opportunities to screen for, identify, and initiate treatment of gambling-related problems. It should be noted that this was a treatment sample, as participants were identified from among people receiving outpatient care for schizophrenia/schizoaffective disorder. While the prevalence of gambling and gambling-related problems may be different in people with schizophrenia/schizoaffective disorder who are not receiving care, the data in this sample indicate that mental health clinicians see patients who should be screened for gambling problems.¹⁴

Spending time with a significant other was significantly associated with being in the problem/pathological gambling group. Whereas problem/pathological gambling among the general population is associated with being single or divorced,¹ this was not the case among individuals with psychotic disorders. These findings suggest a peer or social element that is particularly salient for problem/ pathological gambling among individuals in treatment for schizophrenia/schizoaffective disorder. They are also consistent with the findings regarding negative symptoms, which were significantly lower in PPG, since higher levels of negative symptoms may decrease the likelihood of having a romantic relationship.

Patterns of Gambling Behavior

As in the GIBS study,^{1,38,39} problem gamblers with schizophrenia/schizoaffective disorder in the present study differed significantly from recreational gamblers with schizophrenia/schizoaffective disorder. They were more likely to report gambling for excitement; they reported starting to gamble earlier in life and gambling more frequently; and they bet, won, and lost larger amounts of money than recreational gamblers. These results are similar to comparisons

in the general population between recreational and problem gamblers.^{38,39} However, in that people with schizophrenia/ schizoaffective disorder may exist on limited incomes, patterns of wagering most likely have important implications. With a smaller financial margin, individuals with schizophrenia/schizoaffective disorder may choose to spend their limited funds on gambling rather than on housing, food, or medication, potentially leading to poor clinical and functional outcomes.¹⁵

Strengths and Limitations

This study has multiple strengths and limitations. This study is one of the largest to directly examine gambling behavior in a sample of people with schizophrenia/ schizoaffective disorder, using DSM-IV criteria and structured psychiatric assessments. However, these data are limited by their cross-sectional nature, so that temporal relationships are difficult to ascertain. Future longitudinal data will be important to understand what factors increase the risk for development of gambling problems in patients with psychotic disorders. The data are also limited by the use of administrative data to identify patients with schizophrenia/schizoaffective disorder, so that there may be some individuals in the sample who would not meet diagnostic criteria for schizophrenia/schizoaffective disorder using a structured diagnostic assessment; in addition, the sample does not include people with schizophrenia/ schizoaffective disorder who are not receiving care. The threshold used to classify nongamblers may have missed individuals with gambling problems (eg, people who gambled infrequently but lost substantial amounts of money). Finally, the measures were all self-reported and thus limited by an individual's ability and willingness to recall information and report it accurately.

CONCLUSIONS

The effects of problem and pathological gambling can be devastating for any individual but may be particularly so in patients with severe mental illness. There are interventions for pathological gambling, such as Gamblers Anonymous, although the extent to which these and other modalities are appropriate for patients with psychotic disorders has not been investigated. Although multiple medication and behavioral treatments have been investigated for pathological gambling,⁴⁰ most studies have excluded patients with psychotic disorders. Clinicians should screen for potential gambling-related problems in patients with schizophrenia/ schizoaffective disorder, particularly those who are either in recovery or actively abusing drugs or alcohol. Although not yet validated in individuals with psychotic disorders, the South Oaks Gambling Screen⁴¹ is widely used in clinical settings as a screen for problem and pathological gambling. Alternatively, the NODS instrument¹ might be considered, as it is brief (12 items) and based on DSM-IV criteria. Finally, these data highlight the need for further study of potential risk and protective correlates of problem and pathological gambling in patients suffering from psychotic disorders and the need for investigations into effective therapies for these patients.

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Funding/support: None reported.

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