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

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Abstract

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.

Methods—A sample of outpatient subjects (n=337) diagnosed with schizophrenia/schizoaffective disorder or schizoaffective disorder and treated in either a VA hospital or a local state 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 non-gamblers.

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=0.007), higher depression scores (p=0.04), and more outpatient mental health care utilization (p=0.03). 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.

Introduction

While 86% of American adults report gambling at least once in their lives [1, 2], 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

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suicide [3–5]. It has been estimated that up to 5% of the general U.S. population suffers from problem or pathological gambling [6, 7], although more recent studies suggest lower prevalence estimates [8, 9]. Epidemiological data suggest that pathological gamblers are more likely to be male [6, 10], younger [6], and possibly of lower socio-economic status [11]. Several studies have suggested frequent co-occurrence between psychiatric disorders and disorders of impaired impulse control, including pathological gambling [12–15]. The St. Louis site of the ECA study, a community study, found that both recreational gamblers and problem gamblers were more likely than non-gamblers to suffer from psychiatric disorders [14], and an odds ratio of 3.5 was reported between problem/pathological gambling and schizophrenia. Additionally, Grant and colleagues [15] 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 [16, 17]. However, a systematic examination of gambling behaviors and their clinical correlates in individuals in outpatient treatment for psychotic disorders have 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 [18, 19], and these associations persist to a lesser extent among recreational gamblers [20, 21]. 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 for 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 population average; 2) problem/pathological gambling would be associated with adverse measures of functioning in legal and clinical domains, and amongst the latter, in measures of psychosis and non-psychotic mental health and substance abuse measures; and 3) similar to samples who do not have schizophrenia/schizoaffective disorder, problem/pathological and recreational gamblers in this study would report differences with respect to clinical associations and patterns of gambling.

Methods

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/schizoaffective disorder 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 response rate was 80.6%.

Interviews generally lasted between 1–1.5 hours and included information on socio-demographics, housing, social support and functioning. Widely used, validated measures were used to assess clinical symptoms using the Positive and Negative Symptom Scale (PANSS) [22], the Center for Epidemiological Studies-Depression scale (CES-D) [23], the Addiction Severity Index (ASI) for drugs and alcohol [24], and the Diagnostic Interview Schedule (DIS) assessment for nicotine dependence. Gambling behaviors were assessed using items from the Gambling Impact and Behavior Study (GIBS), a national population-based study of gambling in the U.S. [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 NORC diagnostic Screen (NODS), an instrument that has been found to 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.

Correlates examined included gender, age, education, income, race, 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 and how often respondents had engaged in social activities in the previous month; 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 non-gamblers, recreational gamblers, and those with problem/pathological gambling. Second, the three groups were compared on all of the covariates listed above using Chi-square 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 are presented that compare both recreational and problem/pathological gamblers to non-gamblers. Finally, recreational and problem/pathological gamblers are compared on the characteristics of their gambling, such as motivations for gambling, age of onset, frequency of playing, largest wins and losses, and favorite types of games using Chi-square tests for significance.

Results

Three-hundred-and-thirty-seven participants completed the interview process. There were 155 (46%) participants categorized as non-gamblers; 117 (34.7%) categorized as recreational gamblers; and 65 (19.3%) categorized as problem/pathological gamblers (PPG). This frequency of problem/pathological gambling is conservatively estimated at approximately four times that in the general population [6, 7]. Of those with problem/pathological gambling, 33 (50.77%) met the threshold for pathological gambling, and this represented 9.68% of the entire sample. A chi-square 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=0.33).

Table 1 presents the bivariate associations between socio-demographic characteristics and gambling groups. Unlike the general population, where males and younger respondents are more likely to be PPG [10], gender and age measures were similar across gambling groups. There were also no differences across race, 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 three groups. The most statistically significant findings were observed for measures of arrest ($p<0.002$) and incarceration ($p<0.006$). In both cases, non-gamblers had the lowest proportions of acknowledgement and the PPG group had comparable or higher proportions as compared to recreational gamblers (Table 2). Similarly, the PPG group had the highest frequency of threatening behavior ($p=0.03$), were more likely to have used mental health services in the previous month ($p=0.04$), had significantly higher ASI alcohol scores ($p=0.01$) and had the highest CES-D depression scores ($p=0.02$). Measures of social activity are also included in Table 2, indicating that those with PPG reported spending more time with a significant other in the previous month ($p=0.02$).

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 non-significant and also did not exert a confounding effect upon other variables in the model. Adjusting for other factors, women in the sample were more likely to be recreational gamblers (OR=2.0, $p=0.02$) 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, $p=0.006$) and tended to be less likely to be PPG, although this finding did not reach statistical significance ($p=0.06$). 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, $p=0.007$). 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, $p=0.04$). Both groups of gamblers were significantly more likely than non-gamblers 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, $p=0.008$).

In the sub-sample 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 ($p<0.001$) and have started gambling before age 18 ($p=0.04$). They gambled on average a greater number of days in the previous year (mean of 144 days compared to 40 days for problem/pathological gamblers, $p<0.001$). They were more likely to place large bets ($p=0.001$), and more likely to have wins ($p=0.005$) or losses of $500 or more ($p<0.001$). Finally, they were less likely to report lottery as their favorite type of game and more likely to endorse card gambling or betting on sports as their favorite ($p=0.001$).

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 for 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 four-fold higher than those reported in community studies that utilize screening instruments, and approximately fifteen- to twenty-fold higher than studies using DSM-based criteria [2, 20]. 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 [14].

The data identified several important health and functioning correlates of gambling in this sample. First, some differences observed in general population samples (e.g. 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 gambling group in this sample of people with schizophrenia/schizoaffective disorder. This 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 non-psychotic 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, which did not persist in multivariable models. It is possible that there were other factors that confounded the unadjusted association, such as alcohol use/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 where 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 suggest 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 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 that they both 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 co-occurring disorders in non-psychotic 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 (e.g. alcoholism), they may be vulnerable to substituting another (e.g. 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 should be aware of gambling as a potentially addictive behavior in patients with schizophrenia/schizoaffective disorder, and should 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 non-gamblers. This is consistent with other community data on comorbidity between gambling and other disorders [20, 21]. 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 (e.g. stronger) for those with schizophrenia/schizoaffective disorder than in 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 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, inter-related 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 and 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 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 non-gamblers, increasing the opportunities to screen for, identify, and initiate treatment for 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 [15].

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 amongst individuals with psychotic disorders. These findings suggest a peer or social element that is particularly salient for problem/pathological gambling amongst individuals in treatment for schizophrenia/schizoaffective disorder. They are also consistent with the findings regarding negative symptoms, which were significantly lower in those with PPG, since higher levels of negative symptoms may decrease the likelihood of having a romantic relationship.

Patterns of Gambling Behavior

Similar to data from the GIBS study [2, 38, 39], problem gamblers with schizophrenia/schizoaffective disorder 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 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[16].

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; as well, the sample does not include people with schizophrenia/schizoaffective disorder who are not receiving care. The threshold used to classify non-gamblers may have missed individuals with gambling problems (e.g., if people 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 Screen is widely used in clinical settings as a screen for problem and pathological gambling. Alternatively, the NODS instrument 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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Table 1

Socio-demographic characteristics of a sample of people with schizophrenia/schizoaffective disorder, by gambling group

	Gambler Type							
	Non Gambler (n=155)		Recreational Gambler (n=117)		Prob/Path Gambler (n=65)			
Variable	n or mean	% or s.d.	n or mean	% or s.d.	n or mean	% or s.d.	χ^2 or F	p
Race/Ethnicity							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		
Gender								
Female	49	31.6	29	24.8	18	27.7	1.55	.461
Age	47.70	11.27	46.89	11.80	45.17	8.67	1.20	.300
Single	85	54.8	53	45.3	44	67.7	8.52	.014
Living in own house or apartment	88	56.8	75	64.1	33	50.8	3.28	.194
No Employment	124	80.0	96	82.1	51	78.5	0.37	.830
Education, years	12.64	2.48	12.32	2.09	11.86	2.63	2.52	.082
Income, dollars	3,847.94	16,154.03	1,244.09	1,245.07	2,702.48	12,586.21	1.44	.238

Table 2

Clinical and Functioning Measure Characteristics of a sample of people with schizophrenia/schizoaffective disorder, by gambling group

		Non Gambler		Recreational Gambler		Prob/Path Gambler			
Variable	**Range**	**n or mean**	**% or s.d.**	**n or mean**	**% or s.d.**	**n or mean**	**% or s.d.**	**χ^2 or F**	**p**
Legal/Violence									
Arrested		81	52.3	82	70.1	47	72.3	12.45	.002
Ever Incarcerated		54	34.8	53	45.3	37	57.8	10.20	.006
Threatened to injure other, past year		13	8.4	5	4.3	10	15.6	6.96	.031
Social Functioning, past month									
Fun, shopping, eating out	0–4	3.05	1.02	3.07	0.99	3.18	0.93	0.47	.628
Do things with friends	0–4	1.90	1.38	1.92	1.31	1.77	1.21	0.31	.732
Planned activity with somebody else	0–4	1.38	1.35	1.70	1.24	1.58	1.26	2.14	.119
Spend time with significant other	0–4	1.10	1.63	1.56	1.69	1.66	1.64	3.82	.023
Visit somebody	0–4	1.59	1.33	1.90	1.32	1.83	1.41	1.87	.155
Suicidality									
Thought of hurting/killing self, past yr		26	16.8	26	22.2	13	20.3	1.32	.518
Attempted to hurt/kill self, past year		9	5.8	6	5.1	2	3.2	0.66	.719
Mental Health Utilization, past month									
≥ Psychiatrist, clinician, therapist visit		131	84.5	107	91.5	62	95.4	6.62	.037
≥Emergency mental health visit		12	7.8	19	16.2	5	7.8	5.66	.059
Clinical Measures									
ASI Alcohol	0–1	0.06	0.12	0.08	0.12	0.12[1]	0.02	4.35	.014
ASI Drug	0–1	0.02	0.05	0.03	0.06	0.04[2]	0.07	2.99	.051
CES-D	0–60	22.94	12.27	23.84	12.07	27.70[2]	9.35	3.82	.023
DIS Tobacco dependence (yes/no)		83	53.5	76	65.0	44	67.7	5.49	.064
PANSS Scores									
Total	1–7	2.50	0.58	2.34	0.50	2.46	0.48	2.76	.065
Positive symptoms	1–7	2.46	0.68	2.34	0.63	2.42	0.08	1.17	.313
Negative symptoms	1–7	2.67	0.79	2.47	0.66	2.58	0.61	2.58	.077

[1] $p \leq .01$ for pairwise comparison with non-gamblers

[2] $p \leq .05$ for pairwise comparison with non-gamblers

Table 3

Multinomial Logistic Regression Models of the Association between Gambling and Demographic and Clinical Characteristics

	Recreational Gamblers			*Problem/Pathological Gamblers*		
Variable	**OR[1] (95% CI)**	**Wald**	**p**	**OR[1] (95% CI)**	**Wald**	**p**
Age, yrs	0.98 (0.95, 1.00)	3.62	.057	0.98 (0.94, 1.01)	2.21	.137
Gender (ref: female)	2.00 (1.10, 3.61)	5.19	.023	1.67 (0.77, 3.63)	1.69	.194
Single (ref: not single)	0.74 (0.42, 1.30)	1.13	.289	2.04 (0.98, 4.17)	3.65	.056
Negative symptoms psychosis (PANSS)[2]	0.58 (0.39, 0.86)	7.44	.006	0.61 (0.37, 1.02)	3.60	.058
Alcohol abuse/dependence (ASI)[3]	1.10 (0.88, 1.37)	0.64	.424	1.42 (1.10, 1.83)	7.39	.007
Depression (CES-D)[4]	1.01 (0.98, 1.03)	0.38	.541	1.03 (1.00, 1.07)	4.42	.035
Any outpatient mental health visit, past mo. (ref: none)	2.27 (1.00, 5.26)	3.84	.050	5.56 (1.20, 2.50)	4.83	.028
Any emergency mental health visit, past mo. (ref: none)	2.08 (0.88, 5.00)	2.78	.095	0.63 (0.19, 2.04)	0.60	.438
Threatened to injure other, past yr. (ref: did not threaten)	0.36 (0.12, 1.11)	3.14	.077	1.08 (0.38, 3.03)	0.02	.894
Time spent w/significant other, past mo.	1.16 (0.99, 1.16)	3.38	.066	1.31 (1.07, 1.59)	6.95	.008

[1] Odds Ratio represents the association between variable and gambling group, with non-gamblers as the reference group

[2] Positive and Negative Syndrome Scale

[3] Addiction Severity Index

[4] Center for Epidemiologic Studies Depression Scale

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Table 4

Comparison of Recreational and Problem/Pathological Gamblers on Gambling Characteristics

	Recreational Gambler		Prob/Path Gambler			
Characteristic	**n or mean**	**% or s.d.**	**n or mean**	**% or s.d.**	**χ^2 or t**	**p**
Reasons for gambling						
Gambling for social activity	19	16.2	15	28.8	3.56	.065
Gambling for service from staff	11	9.4	10	19.2	3.20	.082
Gambling to be around people	20	17.1	16	30.8	4.07	.066
Gambling for excitement	47	40.2	43	82.7	26.15	.000
Gambling to win money	92	78.6	44	84.6	0.82	.408
Patterns of gambling						
Age at onset of gambling						
Before age 18 years	26	22.2	24	37.5	4.83	.037
Frequency of gambling, last year						
Total days gambled	40.21	77.87	144.13	173.83	−4.13	.000
Most ever gambled, day					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, day					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, day					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					17.66	.001
Lottery[1]	67	59.3	24	38.7		
Sports[2]	6	5.3	13	21.0		
Cards[3]	10	8.8	12	19.4		

Characteristic	Recreational Gambler		Prob/Path Gambler			
	n or mean	% or s.d.	n or mean	% or s.d.	χ^2 or t	p
Machine[4]	20	17.7	11	17.7		
Other[5]	10	8.8	2	3.2		

[1] Includes instant lottery games, lottery games and pull-tabs

[2] Includes 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)

[3] Includes card games and general table games

[4] Includes slot machines and video machine games

[5] Includes dice, roulette, live keno, bingo, charitable games, and internet gambling