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Illegal behaviors as a consequence of gambling disorder

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Abstract

Background and Objectives: Gambling disorder has been associated with illegal behaviors; however, research using validated scales and in-person assessments has been less common.

Methods: Four hundred and twenty-seven people with gambling disorders taking part in clinical trials completed multiple instruments and select cognitive tasks. Two groups were identified: those with illegal behaviors linked to gambling disorder and those without. Differences between the groups were examined.

Results: 43.3% of people with gambling disorders reported gambling-related illegal behaviors. Illegal behaviors were associated with earlier gambling symptom onset, higher levels of depressive symptoms, worse quality of life, and higher non-planning impulsivity. In those with illegal behaviors, the most common activities reported were writing bad checks/paying bills from accounts that no longer had funds (75.1%), and theft (9.6%). People with illegal gambling-related behaviors did not differ from those without, in terms of levels of symptom severity, or likelihood of responding to treatment in the subsequent clinical trials.

Discussion and Conclusions: Illegal behaviors are commonplace in people with gambling disorders and linked to worse quality of life, but people with gambling-related illegal behaviors respond to core treatments to the same extent as people without these behaviors.

Scientific Significance: The findings from this study extend previous research and support the novel notion that rather than more intensive treatment being indicated for gambling disorders linked to illegal activities, it may be prudent to consider illegal behaviors as part of a wider profile of gambling-related harms that merit interventions in their own right.

INTRODUCTION

Gambling disorder is characterized by persistent, recurrent maladaptive patterns of gambling behavior and functional impairment,[1] and illegal behaviors have long been recognized as being associated with gambling disorder.[2] Studies have suggested that anywhere from 27% to 60% of people with gambling disorder report at least one illegal activity related to gambling.[3,4] Gambling Disorder can be regarded as a criminogenic risk factor (i.e., a factor that might make an individual more likely to commit illegal acts)

because it often leads to debt and individuals may then resort to illegal acts either as a consequence of debt (e.g., writing a bad check) or to fund the gambling (e.g., embezzlement or stealing).[3,4]

The term "illegal behaviors" herein is used to refer to a variety of acts that are widely regarded as constituting legal problems and/or result in legal problems such as (but not limited to): forging, writing bad checks (i.e., writing checks, including digital payment checks, that the individual later cancels or knows in advance will go unpaid) or paying bills from accounts that no longer have funds, prostitution, different types of fraud (e.g., number "rackets" or embezzlement), theft and legal tax issues. It is important to note that whether a particular instance of such an act is illegal is dependent on context, legal frameworks, and geographical jurisdictions. For example, writing a "bad check" is typically illegal in the United States but not in all countries.

In the progression of gambling disorder, some gamblers resort to illegal acts to finance gambling or to pay outstanding debts due to gambling. Some have argued that the addictive nature of gambling may represent a criminogenic factor,[5] whereas others suggest that these crimes are frequently committed to cover up financial damage from gambling-related losses.[6] More recent data suggests that a third variable (e.g., impulsivity), could mediate the relationship between gambling and criminal behavior.[7] Data suggest that common illegal behaviors associated with gambling disorder include theft, writing bad checks, embezzlement, prostitution, and tax fraud.[2,8] Although these crimes generally may appear to have a minimal social impact, other research suggests that problem gamblers may commit violent crimes at high rates but these crimes may have been concealed by deliberate and unintentional under-reporting of gambling-related crimes.[9] Furthermore, a study of Indigenous Australian prisoners found that 18% were incarcerated due to gambling-related offenses.[10]

Gamblers with a history of illegal behavior tend to be younger, have more severe gambling disorder symptoms, greater gambling debt, lower income, experienced childhood abuse, report family mental health problems and gambling-related harms, and are more likely to meet criteria for antisocial personality disorder than gamblers who do not have gambling-related criminal behaviour[3,11,12] Gambling-related illegal behaviors also appear to be associated with an elevated risk of suicidal ideation, financial problems, and alcohol and drug use.[11,12]

Although the data on gambling-related illegal behaviors are limited, these studies suggest that illegal behaviors may have associations with both gambling symptom severity and psychosocial impairment associated with gambling disorder. This in turn may suggest that different services or different intensities of services may be necessary for people with gambling disorders who report illegal behaviors associated with their gambling. Therefore, the goal of this study was to better understand how illegal behaviors due to gambling may relate to clinical presentation, symptom severity, and psychosocial impairment in a large sample of adults with gambling disorder. Based on the current literature, we hypothesized that there would be a difference in gambling symptom severity, and co-occurring disorders, as a function of illegal behaviors.

METHODS

Participants

Four hundred and twenty-seven adults with gambling disorder who had participated in clinical trials on pharmacotherapy or psychotherapy from 2003 to 2020 were included. The mean age was 47.5 (±11.7) years and 55.4% were females. The current study used a combined database from 10 published studies, the details of which have been published elsewhere.[13]

Inclusion criteria for all studies were: current gambling disorder according to the Diagnostic and Statistical Manual of Mental Disorder 5—DSM 5[1] (subjects recruited before 2013 met DSM-IV criteria for pathological gambling and were retrospectively examined using the DSM-5 criteria) and the ability to understand the study and the consent form. Exclusion criteria were: bipolar I disorder, schizophrenia, or substance use disorder within the last 3 months. Data at baseline (first visit) were used for the current study. The sample was enlisted in the metropolitan areas of Chicago, IL, USA, and Minneapolis, MN, USA through advertisements on the internet, public places, and newspapers. Participants were compensated with a gift card to local department stores.

Ethics

After receiving a complete description of the study, participants provided written informed consent. All procedures involving human subjects were approved by the Institutional Review Boards at the University of Chicago and the University of Minnesota. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Measures

Participants were assessed for age (in years), biological sex (male or female), and educational level (coded numerically on a scale: 1 less than high school, 2 high school graduate, 3 some college, 4 college graduate, or 5 beyond college graduate) using a semi-structured clinical interview. In addition, a semi-structured clinical interview was used to examine the clinical features of gambling disorder including gambling-related illegal behaviors. The definition of gambling-related behavior is complex. For purposes of this study, we defined these illegal behaviors as those that temporally occurred after the person met the criteria for gambling disorder, and based on the interview, were performed either due to the financial stress of gambling losses

(e.g., stealing money to pay the rent because the person had lost the rent money gambling) or in furtherance of gambling behavior (e.g., stole money to gamble because the person had no other legitimate source of gambling money). We determined the behavior to be illegal based on the law, regardless of whether or not the person was charged with a crime.

Clinical interviews were undertaken by trained raters using the Structured Clinical Interview for DSM,[14] the Structured Clinical Interview for Gambling Disorder (SCI-GD),[15] and the Minnesota Impulse Disorders Inventory (MIDI)[16,17] (the MIDI is a structured clinical interview designed to screen for a range of impulsive disorders such as trichotillomania, kleptomania, compulsive sexual behavior, and binge-eating disorder).

Gambling severity was assessed using the Gambling Symptom Assessment Scale (GSAS), the Yale-Brown Obsessive Compulsive Scale modified for Pathological Gambling (PG-YBOCS), and the Clinical Global Impression scale. The GSAS is a 12-item self-report questionnaire.[18] The items assess urges; gambling involvement; anticipatory excitement/tension; pleasure in gambling; emotional and personal problems due to gambling behavior. The final score ranges between 0 and 48. The PG-YBOCS is a 10-item clinician-administered severity scale of gambling symptoms over the prior 7 days. The scores range from 0 to 40.[19] The CGI is a 7-item clinician-administered Likert scale to assess the severity of gambling disorder. The CGI severity scale ranges from 1 = "not ill at all" to 7 = "among the most extremely ill".[20]

In addition, quality of life was examined using the Quality of life Inventory (QOLI) a 17-item self-administered scale that examines the person's quality of life in different areas,[21] overall psychosocial functioning was quantified using the Sheehan Disability Scale (SDS),[22] and anxiety and depression were examined using the Hamilton Anxiety Rating Scale (HAM-A)[23] and the Hamilton Depression Rating Scale (HAM-D).[24]

Impulsivity was evaluated using the Barratt impulsiveness scale, version 11 (BIS).[25] The BIS-11 is a self-report measure assessing features of impulsivity. The measure consists of 30 items, with responses ranging from 1 (Rarely/Never) to 4 (Almost Always/Always). Responses are broken down into three secondary factors: attentional impulsivity, nonplanning impulsivity, and motor impulsivity.

Cognitive tasks for this study included the Stop Signal Task (SST) and the Intra/Extradimensional Task (IED). We focused on these tasks since the symptoms of gambling disorder suggest underlying problems with shifting behavior (shifting attention away to nongambling activities) and impulsivity (inappropriate premature actions that result in deleterious long-term outcomes).[26,27] The SST assesses the ability to suppress impulsive responses that are rendered prepotent, an ability dependent on distributed circuitry including the right inferior frontal gyrus and anterior cingulate cortices.[28] The IED task assesses aspects of learning and cognitive flexibility, which have been shown to be dependent on distributed frontostriatal circuitry including the dorsolateral prefrontal cortices.[29] Both tasks were taken from the computerized Cambridge Neuropsychological Test Automated Battery (CANTABeclipse, version 3; Cambridge Cognition Ltd.). For SST, the measure of interest was stop-signal reaction time (SSRT), which measures the time taken for an individual's brain to suppress a response that would normally be made. For IDED, the measure of interest was the total errors on the crucial extra-dimensional (ED) set-shifting stage.

Data analysis

Before analysis, participants were classified into two groups: those who reported an illegal behavior secondary to gambling and those who did not. Demographic and clinical characteristics between the groups were compared using independent sample *t*-tests for continuous variables and Pearson's chi-square tests for categorical variables. Data were checked for approximation to normal distributions and where model assumptions were substantially violated, nonparametric tests were used. For significant group differences, effect sizes were reported (Cohen's *D* unless otherwise indicated). Statistical significance was defined as $p < .01$ given that multiple comparisons were performed. This threshold was used to strike a balance between risk of false positive and false negative findings. All analyses were conducted using JMP Pro software.

RESULTS

Gamblers with and without illegal behaviors

The demographic and clinical measures from the two groups are presented in Table 1.

In terms of demographic characteristics, those who had illegal behaviors were younger (Cohen's $D = 0.28$), had started gambling younger ($D = 0.354$) (and had problems with gambling at a younger age, $D = 0.418$), and had worse quality of life ($D = 0.568$). Interestingly, those with illegal behaviors were significantly more likely to have received previous gambling treatment. The groups did not differ in terms of education levels or gender.

Types of illegal behavior

In the group who had illegal behaviors, the vast majority (177, 95.6%) provided more detailed information about particular types of illegal behaviors (these questions were optional as we recognized some individuals may not wish to have disclosed specific acts but would be willing to admit to doing unspecified illegal acts). The numbers and percentage of that group endorsing particular problems were as follows: forgery 7 [4.0%], writing bad checks/paying bills from accounts that no longer had funds 133 [75.1%], prostitution 1 [0.6%], number racket 1 [0.6%], embezzlement 7 [4.0%], theft 17 [9.6%], and tax issues 8 [4.5%]. The percentages of the total sample (i.e., all gamblers) thus admitting to particular

TABLE 1 Demographic and clinical characteristics of the groups

Demographic and clinical characteristics	No legal problems (*N* = 242) Mean / *N*	Std dev / *%*	Any legal problems (*N* = 185) Mean / *N*	Std dev / *%*	*t*-test/chi-square	*p*
Age, years	48.92	12.09	45.67	10.89	−2.910	**.0038**
Sex						
Female	*133*	*54.96%*	*104*	*55.91%*	0.039	.8440
Education level	3.15	1.06	3.03	0.97	−1.156	.2480
Previous gambling treatment?						
Yes	58	*35.80%*	81	*58.27%*	15.199	**<.0001**
Age when gambling started, years	31.29	14.55	26.29	13.59	−3.351	**.0009**
Age when gambling became a problem, years	40.23	12.98	35.05	11.63	−3.883	**.0001**
Annual income (USD)	45,432	33,442	43,089	30,256	−0.560	.5560
Amount lost to gambling (USD), past year	27,180	37,405	24,572	24,865	−0.769	.4420
Any mental health comorbidity?						
Yes	99	*40.90%*	82	*43.90%*	0.374	.5408

Note: Scientifically significant results have a bolded *p*-value (statistical significance was defined as $p < .01$ given that multiple comparisons were performed).
Abbreviation: USD, United States Dollars.

illegal behaviors due to gambling were: forgery 1.6%, writing bad checks/paying without adequate funds 31.1%, prostitution 0.2%, numbers racket 0.2%, embezzlement 1.6%, theft 4.0%, and tax issues 1.9%.

Illegal behaviors and gambling severity

Compared to those without illegal behaviors, those who had committed illegal behaviors had significantly worse gambling symptoms on only one measure (the CGI, $D = 0.302$) and reported more depressive symptoms ($D = 0.300$); and lower quality of life ($D = 0.568$). The two groups did not differ in terms of disability, other measures of gambling severity (GSAS or PG-YBOCS) or treatment response in the context of controlled clinical trials they participated in subsequently (Table 2).

Comorbidity associated with illegal behaviors

There were no significant group differences in terms of the overall percentage of people experiencing one or more mental health comorbidities (Table 1; for details of comorbidities see Table 3).

Impulsivity and illegal behaviors

Table 4 presents detailed data on impulsivity and cognitive tasks. The groups differed significantly with those who had gambling-related illegal behaviors having greater levels of nonplanning impulsivity ($D = 0.727$). In terms of cognitive tasks, the groups did not differ in terms of motor impulsivity or cognitive flexibility.

DISCUSSION

There have been only a few studies focusing on associations of illegal behavior with respect to gambling disorder, and this study adds to the literature by demonstrating that there are far more similarities than differences in adults with gambling disorder between those who do or do not commit illegal activities. However, several differences between the two study groups were found. The striking differences seem to be that those individuals with gambling-related illegal activities reported starting to gamble at a significantly younger age, have an earlier age when gambling first became problematic, had worse quality of life associated with gambling, had higher levels of depressive symptoms, and were more likely to have received gambling treatment. It is important to note that we defined "illegal behaviors" in a broad fashion, including transgressions that may be regarded as relatively minor, thorough to more serious ones (in terms of legal consequences/punishment).

These findings are largely generally in keeping with previous data[3,7–12] although we did not find that most measures of gambling severity differed between groups nor did the SDS differ. Unlike previous studies, however, this study found that poorer quality of life was associated with illegal behaviors. This suggests that the criminal behavior of gambling may take quite a toll on their lives (unlike the idea that it is merely antisocial and ego-syntonic). This poorer quality

TABLE 2 Level of gambling disorder severity and related features in the two groups

Clinical measures	No legal problems (*N* = 242) Mean *N*	Std dev %	Any legal problems (*N* = 185) Mean *N*	Std dev %	*t*/chi-square	*p*
Clinical Global Impression	4.70	0.81	4.95	0.86	2.913	**.0038**
GSAS	33.80	11.18	36.73	13.25	2.257	.0247
PG-YBOCS	20.57	5.17	21.65	5.50	1.591	.1130
Sheehan Disability Scale	13.77	6.93	15.61	6.50	2.181	.0302
Quality of life (*t*-score)	36.36	15.20	28.30	12.18	−2.943	**.0041**
HAMA	7.11	4.74	7.79	4.65	1.387	.1662
HAMD	6.56	3.83	7.79	4.42	2.829	**.0049**
CGI Responder to treatment?						
No	94	*52.51%*	65	*49.62%*		
Yes	85	*47.49%*	66	*50.38%*	0.254	.6144

Note: CGI Responder to treatment indicates whether patients responded to clinical trial intervention (active treatment or placebo, viewed in the round). Scientifically significant results have a bolded *p*-value (statistical significance was defined as $p < .01$ given that multiple comparisons were performed).

Abbreviations: GSAS, Gambling Symptom Assessment Scale; HAMA, Hamilton Anxiety Scale; HAMD, Hamilton Depression Scale; PG-YBOCS, Pathological Gambling Yale-Brown Obsessive-Compulsive Scale.

TABLE 3 Overview of key current comorbidities in the study groups

Current comorbidities	No legal problems (*N* = 242) *N*	%	Any legal problems (*N* = 185) *N*	%
MDD	42	*20.39%*	44	*28.57%*
Social anxiety disorder	8	*3.88%*	3	*1.95%*
Panic disorder	6	*2.91%*	7	*4.55%*
Any anxiety disorder	23	*11.17%*	14	*9.09%*
Binge eating disorder	5	*2.43%*	4	*2.60%*
Trichotillomania	1	*0.44%*	1	*0.53%*
Compulsive sexual behavior	6	*2.67%*	5	*2.67%*
Kleptomania	4	*1.78%*	2	*1.07%*
Intermittent explosive disorder	0	*0.00%*	1	*0.53%*
Compulsive buying	12	*5.33%*	7	*3.74%*

Note: cell sizes may differ from the total sample size where data were not available for some participants. The groups did not differ overall on the presence of comorbidities, as shown in Table 1; therefore, post hoc comparisons of each disorder were not undertaken in this table.

of life is unlikely to be due to other factors previously associated with illegal behaviors of gambling, namely having worse gambling symptoms on gold-standard measures (GSAS and PG-YBOCS) and more mental health issues—since our two groups did not differ significantly on these variables. We found that illegal behaviors were linked to worse Clinical Global Impression (CGI), but not GSAS or YBOCS. We suspect that clinicians form an impression of severity that also considers contextual variables and wider gambling harms such as illegal acts, whereas the conventional gold-standard severity measures (GSAS and YBOCS) do not take this into consideration in the same way. This highlights the importance to consider not only gambling symptoms themselves when evaluating patients but also wider gambling-related harms that are not quantified by these instruments or necessarily the target of current interventions.[30]

Interestingly, treatment responses in our studies did not significantly differ based on whether a person had committed an illegal act second to their gambling. This was also found in the study by Ledgerwood and colleagues.[3] In that study, however, the authors

TABLE 4 Traits and cognition in the study groups

Traits and Cognition	No legal problems (*N* = 242)		Any legal problems (*N* = 185)			
	Mean	Std dev	Mean	Std dev	*t*	*p*
BIS Attentional	18.28	3.44	19.09	4.20	0.881	.3820
BIS Motor	26.97	3.74	26.69	3.72	−0.321	.7490
BIS Nonplanning	28.17	4.80	31.53	4.43	3.023	**.0036**
SST SSRT	172.21	42.54	187.84	58.84	1.088	.2830
IED ED stage errors	13.07	10.49	9.08	8.85	−1.501	.1400

Note: Scientifically significant results have a bolded *p*-value (statistical significance was defined as $p < .01$ given that multiple comparisons were performed).
Abbreviations: BIS, Barratt Impulsivity Scale; ED, Extra-dimensional shift; IED, Intra-Dimensional/Extra-Dimensional Task; SSRT, Stop-Signal Reaction Time; SST, Stop-Signal Task.

recommended more intensive treatment could be warranted for individuals with gambling-related illegal behavior due to reporting greater gambling severity throughout treatment and follow-up. The current data would suggest that more intensive treatment would not necessarily be needed for treatment of core symptoms of gambling disorder in those with illegal behaviors. Instead illegal behaviors should be considered part of a wider set of "gambling-related harms" that merit consideration in their own right. Treatment studies may wish to examine the legal issues more thoroughly to see their associations over time with relapse or remission.

There are several limitations to the current study. We focused our analysis on comparing gambling disordered adults with and without illegal behaviors secondary to gambling. We acknowledge that the terminology/definition of gambling-related illegal behaviors is itself not universally accepted or particularly easy to assess. There are potentially multiple illegal behaviors associated with gambling disorder and questions arise as to whether they should be seen similarly. For example, writing bad checks may be illegal but it may not compare to a crime such as embezzlement. We suggest it may be a useful starting point to better understand how certain illegal behaviors may differ in the clinical features/presentation of gambling disorder. Future work may wish to examine whether the clinical presentation of gambling disorder differs based on level of criminal severity, rather than the broader category of any illegal behavior. This would require a larger sample size. Because the data set was pooled from previous clinical trial studies (treatment trials), the data may not generalize to individuals with gambling disorder who do not participate in treatment trials and/or are not treatment seeking. Another limitation is that the data are cross-sectional (rather than, e.g., a longitudinal study examining the emergence of illegal activities over time), and so causality cannot be ascribed between the variables.

In conclusion, this study found that people with gambling disorder who report illegal behaviors secondary to their gambling report an earlier age at first gambling, and earlier age of gambling becoming problematic, as well as lower quality of life, and higher levels of depressive symptoms, as well as elevated non-planning impulsivity. The most common illegal behaviors endorsed in our study were writing bad checks/paying bills from accounts that no longer had funds (75.1%), and theft (9.6%). Future work should examine differences in the clinical features of gambling disorder based on specific types of illegal activities using larger sample sizes, ideally also longitudinally, addressing not only core symptoms but also wider profiles of gambling-related harms.

AUTHOR CONTRIBUTIONS

Both authors contributed to the study concept and design, analysis and interpretation of data, and statistical analysis. Both authors had full access to all data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

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CONFLICTS OF INTEREST

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