

Predictors of Pathological Gambling Severity Taking Gender Differences into Account

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Key Words

Pathological gambling · Predictors · Gender differences

Abstract

Background: The current study aims to identify predictors of pathological gambling (PG) severity, taking gender differences into account, in an outpatient sample of pathological gamblers seeking treatment. **Methods:** The sample for this study consisted of 103 subjects (51 women and 52 men) meeting current DSM-IV-TR criteria for PG. Linear and logistic regression analyses were used to examine different risk factors (gender, age, impulsivity, sensation seeking, self-esteem) and risk markers (depression, anxiety, gambling-related thoughts, substance abuse) as predictors of PG severity. **Results:** Impulsivity, maladjustment in everyday life and age at gambling onset were the best predictors in the overall sample. When gender differences were taken into account, duration of gambling disorder in women and depression and impulsivity in men predicted PG severity. In turn, a high degree of severity in the South Oaks Gambling Screen score was related to older age and more family support in women and to low self-esteem and alcohol abuse in men. Female gamblers were older than male gamblers and started gambling later in life, but became dependent on gambling more

quickly than men. **Conclusions:** Further research should examine these data to tailor treatment to specific patients' needs according to sex and individual characteristics.

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Introduction

The expansion of gambling has been identified as an important public health concern. Pathological gambling (PG) is a chronic, progressive disorder characterized by gambling behavior that is persistent and recurrent, with frequent relapses. This disorder includes an inability to resist gambling, as well as negative personal and social consequences. PG often occurs in conjunction with other disorders including alcohol abuse [1], depression [2] or personality disorders [3]. Actually, there is empirical evidence about the frequent cooccurrence of addictive disorders (PG, smoking, cannabis and alcohol abuse) [4].

This means that PG is not a simple problem but rather a severe disorder that negatively affects the psychosocial functioning, quality of life and emotional well-being of patients and those around them. This disorder is currently considered a major public health problem [5].

Many different risk factors and risk markers may contribute to the development and maintenance of a gambling problem. Biological, psychological and social factors interact in a complex manner and contribute to the development and maintenance of gambling-related problems [6–8]. For instance, personality studies have described high levels of sensation seeking and impulsivity among pathological gamblers [3, 9]. High impulsivity is the only personality characteristic associated with all addictive behaviors [4]. In addition, about 25% of these subjects have a history of attention deficit hyperactivity disorder (ADHD) [4] and are characterized as having more severe gambling problems and a higher level of gambling-related cognitions, a higher frequency of psychiatric comorbidities and an elevated risk of suicide. PG with a comorbid ADHD is known to worsen the prognosis [10].

Moreover, some specific personality traits have been found to be gender specific (principally, harm avoidance in female pathological gamblers) [11]. Women are more likely than men to gamble in order to relieve feelings of depression and anxiety and to escape dysphoria. Gambling in women is used for regulating negative emotional states associated with life events [11, 12]. In addition, male pathological gamblers appear to be more likely to suffer from a current alcohol abuse, but less likely than women to suffer from comorbid anxiety or mood disorder [13]. Also, women become dependent on gambling and substance-related disorders more quickly than men (the telescoping effect). This difference in the progress of the disorder has also been found in other studies [14–17].

However, the relative importance of the different variables considered individually in correlation with the severity of the problem has not been definitively determined. Moreover, the pattern of risk factors is often different for men and women, and the age at onset is also variable.

Among the variables involved in PG, the risk factors and risk markers, which can predict the severity of PG, usually appear at the onset of gambling behavior and, in turn, are divided into personal, family, social and environmental factors [18]. Problem or pathological gamblers differ in the severity of their gambling-related symptoms. The severity of problem gambling can be influenced by certain risk factors, such as gender [19–22], personality traits such as impulsivity [23–25] and risk markers such as psychiatric comorbidity (depression, high levels of anxiety and stress), gambling-related cognitions [26, 27] and substance abuse [28]. Impulsivity can be considered as a tendency to act upon ideas that are poorly conceived, prematurely expressed, unduly risky, or inappropriate to

the situation and that often result in undesirable outcomes [29].

Some variables, however, precede the onset of gambling (gender, impulsivity, etc.), but some other measures are taken cross-sectionally, such as depression or gambling-related thoughts.

Although some risk factors are common to both male and female pathological gamblers, there are specific risk factors and significant differential aspects of the course of the disorder according to gender. Two major types of vulnerability to dependence on gambling have been identified: the impulsive/antisocial pattern predominant in men and the emotional pattern characteristic of women [19, 30, 31].

Prior research about risk factors associated with the development and maintenance of PG needs to be expanded. As far as we know, no study has systematically examined predictors of PG severity taking gender differences into account. This reveals a real need for empirical research into the sociodemographic, clinical and gambling factors associated with PG severity and their influence as predictors of the same. The current study, therefore, aims to analyze these predictors in a sample of pathological gamblers seeking treatment, taking gender differences into account. Consistent with previous literature and our prior research, we hypothesized that impulsivity for both genders, high sensation seeking and alcohol abuse for men, and depression and anxiety for women, would be the most relevant predictors of PG severity.

Material and Methods

Participants

The sample consisted of 103 pathological gamblers (51 women and 52 men) meeting current DSM-IV-TR criteria for PG. Subjects were recruited over a 5-year period (2005–2009). All of them sought treatment in various Pathological Gambling Units throughout Spain because of their problems and impairment related to PG. All patients meeting the following inclusion criteria were included: (a) primary diagnosis of current DSM-IV-TR for PG, and (b) age 18 or older. The only exclusion criteria were the presence of a psychotic disorder, bipolar disorder, cognitive or intellectual disability, dementia or inability to understand and consent to the study.

The mean age of gamblers was 43.09 years ($SD = 13.30$). The sociodemographic characteristics of the sample are provided in table 1 according to the Hollingshead and Redlich Scale [32].

Regarding the gambling variables, the mean age at gambling onset was 28.97 years ($SD = 14.23$), and the age at onset of a disorder was 36.76 ($SD = 13.73$). The mean period of gambling dependency was 7.77 years. In 67% of cases, there was a trigger event (such as a financial problem, sudden loneliness, breakup of a cou-

Table 1. Sociodemographic characteristics of pathological gamblers

Civil status	
Married	44 (42.7%)
Single	35 (34.0%)
Divorced	15 (14.6%)
Widower	9 (8.7%)
Educational level	
Uneducated	5 (4.9%)
Primary school	57 (55.9%)
High school	30 (29.4%)
College	10 (9.8%)
Employment status	
Active	52 (52.0%)
Unemployed	25 (25.0%)
Retired	11 (11.0%)
Prolonged period of time off work	12 (12.0%)
Socioeconomic level	
Low	13 (12.7%)
Medium-low	16 (15.7%)
Medium	62 (60.8%)
Medium-high	8 (7.8%)
High	3 (2.9%)
Social and family support	
Family support	86 (83.5%)
Social support	55 (53.9%)

ple, family problems, social pressure or adjustment difficulties at work) related to the onset of gambling. Slot machines were the most popular gambling method in 79.6% of gamblers. The most relevant gambling, personality and psychopathological variables are presented in table 2.

Measures

Gambling Measures

The Structured Clinical Interview for Pathological Gambling [33] is an instrument designed with the objective of assessing, in an initial interview, PG according to the DSM-IV criteria. The content of the interview is also related to the most relevant information: current difficulties, current mental disorders, history, family, education, work, social relationships, alcohol and drug abuse, hobbies, etc. Inter-rater reliability of this interview (median kappa = 0.73) was moderately good.

The South Oaks Gambling Screen (SOGS) [34, 35] is a reliable, valid, 20-item, self-report screening instrument. It assesses gambling symptoms over a person's lifetime. In the Spanish version, this assessment tool has a test-retest reliability of 0.98 and the internal consistency is 0.94. In our study the internal consistency is 0.96. The convergent validity with DSM-IV criteria is 0.92. The range is from 0 to 19. A score of 5 or more on the SOGS indicates probable PG.

The Inventory of Gambling-Related Thoughts (IGRT) [36] is a 21-item, self-report assessment to screen for a range of gambling-related irrational beliefs in gamblers. The first subscale (15 items) deals with cognitive distortions related to gambling behav-

Table 2. Gambling, personality and clinical characteristics of pathological gamblers (mean \pm SD)

Gambling variables	
Age at onset – gambling, years	28.97 \pm 14.23
Age at onset – disorder, years	36.76 \pm 13.73
Duration of gambling disorder, years	7.77 \pm 8.45
Gambling dependency (SOGS)	9.98 \pm 3.19
Cognitive distortions (IGRT)	7.86 \pm 3.59
Debt	59 (58.4%)
Family history (gambling)	39 (37.9%)
Personality traits	
Anxiety (STAI-T)	30.04 \pm 11.41
Impulsivity (BIS-10)	63.70 \pm 16.57
Sensation seeking (SSS)	16.72 \pm 5.56
Self-esteem (RSE)	26.70 \pm 5.10
Psychopathological Factors	
Anxiety (STAI-S)	27.94 \pm 1.58
Depression (BDI)	19.52 \pm 12.31
Maladjustment Scale (EI)	17.10 \pm 7.27
Alcohol abuse (AUDIT)	4.69 \pm 5.58

iors (e.g. 'Relating my winnings to my skill and ability makes me continue gambling') and the second (6 items) is focused on biased thoughts about the gambler's perception of his or her problem with gambling. The IGRT has proven to be an instrument with good psychometric properties [19, 20].

Personality Traits

The Trait Anxiety Inventory (STAI-T) [37, 38] consists of 20 items related to anxiety traits. In our study, the internal consistency is 0.94. The range of scores is from 0 to 60.

The Impulsiveness Scale (BIS-10) [39, 40] consists of 33 items aimed at assessing impulsivity. In our study the internal consistency is 0.96. The range of scores is from 0 to 132.

The Sensation Seeking Scale (SSS-V) [41] consists of 40 items aimed at determining the level of sensation seeking disposition. In our study, the internal consistency is 0.84. The range of scores is from 0 to 40.

The Self-Esteem Scale (RSE) [42, 43] assesses the feeling of satisfaction that a person has about him or herself. In our study, the internal consistency is 0.80. The range of scores is from 10 to 40.

Psychopathological Factors

The State Anxiety Inventory (STAI-S) [37, 38] consists of 20 items related to the anxiety state. In our study the internal consistency is 0.92. The range of scores is from 0 to 60.

The Beck Depression Inventory (BDI) [44, 45] consists of 21 items and measures the severity of symptoms of depression. In our study, the internal consistency is 0.84. The range of scores is from 0 to 63.

The Alcohol Use Disorders Identification Test (AUDIT) [46, 47] was designed by the World Health Organization to screen and identify people at risk of developing alcohol problems. This test focuses on identifying the preliminary signs of hazardous drink-

ing and mild dependence. It consists of only 10 questions referring to the quantity and frequency of alcohol consumption, to drinking behavior and to alcohol-related reactions or problems within the last year. In our study, the internal consistency is 0.82. The range of scores is from 0 to 36.

The Maladjustment Scale (EI) [48] reflects the extent to which the subject's gambling problems correlate with maladjustment in everyday life (social, work, leisure, couple and family), and can be used to measure social/family support. In our study, the internal consistency is 0.90. The range of scores is from 0 to 30.

These measures have been used extensively in research and clinical practice, and there is considerable evidence to support their psychometric properties in the field of PG [3, 9, 11, 49, 50].

Procedure

All study participants were enrolled as they entered treatment. They were not paid for their participation in the study and provided voluntary written informed consent.

The participants individually filled in all the questionnaires included in the study during two assessment sessions. The assessment/treatment program was conducted on an outpatient basis at no charge by a clinical psychologist.

The study was approved by the University Ethics Committee and by the Ethics Committees of the different hospitals involved in this research.

Data Analysis

Analyses were carried out using SPSS version 16.0 for Windows.

In addition to a descriptive analysis of the overall sample, a multiple linear regression analysis of the assessed continuous independent variables was performed in order to evaluate their influence as predictors of PG severity measured by SOGS (continuous dependent variable). A method of 'Backward' was selected, and the collinearity was also assessed in the regression model to analyze the effect of each of the independent variables on the dependent variable and consequently to include or exclude them in the model.

The categorical independent variables were evaluated using a factorial ANOVA. The multiple linear regression analysis and ANOVA were used to assess the predictors of gambling severity both in the overall sample of gamblers and in the sample split by gender.

Finally, a logistic regression analysis was used to specifically analyze the variables associated with gender in a subgroup of gamblers of greater severity. Greater severity was defined as having a score in SOGS ≥ 10 .

Results

Predictors of PG Severity in the Overall Sample

Linear regression models and ANOVA were performed to find those factors (sociodemographic, clinical and gambling) independently associated with PG severity. No association was found between evaluated categorical independent variables and PG severity.

Multiple linear regression analyses were performed with SOGS as a dependent variable and the clinical/gambling risk factors associated with PG severity as independent variables.

It has been reported that there are specific risk factors associated with PG according to gender [19, 30, 31]. To control for this effect in the multiple linear regression model, gender was added as independent variable. After controlling for gender, the clinical predictors of PG severity in gamblers were impulsivity ($\beta = 0.265$; $p = 0.017$) and maladjustment in everyday life ($\beta = 0.222$; $p = 0.045$; $R^2 = 0.141$). In relation to gambling variables, only age at gambling onset ($\beta = -0.469$; $p = 0.027$) predicted PG severity in gamblers ($R^2 = 0.129$; tables 3, 4).

Predictors of PG Severity according to Sex

Likewise, the predictors of PG severity according to sex were analyzed for men and women separately.

In the multiple linear regression model, the duration of gambling disorder (years) was the only predictor of PG severity for female gamblers ($\beta = 0.347$; $p = 0.45$). Impulsivity ($\beta = 0.345$; $p = 0.018$) and depression ($\beta = 0.300$; $p = 0.037$) predicted PG severity in male gamblers.

Gender Differences Depending on the Level of PG Severity

A logistic regression with gender as dependent variable and severity of PG (SOGS ≥ 10) as covariate was performed to analyze the influence of this variable on gender in the total sample of gamblers. After controlling for severity of PG, being single ($\beta = -2.593$; $p = 0.013$), low socioeconomic status ($\beta = -1.109$; $p = 0.001$), maladjustment in everyday life ($\beta = -0.113$; $p = 0.036$), alcohol abuse ($\beta = -0.179$; $p = 0.024$) and low self-esteem ($\beta = -0.162$; $p = 0.030$) were associated with male gamblers. In turn, family support ($\beta = 1.891$; $p = 0.016$), trait-state as personality variable ($\beta = 0.068$; $p = 0.045$), age at onset in gambling ($\beta = 0.086$; $p = 0.001$) and duration of gambling disorder ($\beta = 0.006$; $p = 0.038$) were associated with female gamblers.

Finally, gender differences in a subgroup of pathological gamblers of greater severity (SOGS ≥ 10) were analyzed. Overall, among the more severe pathological gamblers, older age ($\beta = 0.117$; $p = 0.001$) and greater family support ($\beta = 3.968$; $p = 0.003$) were associated more with female than with male gamblers. As far as personality and psychopathological factors are concerned, low self-esteem ($\beta = -0.263$; $p = 0.040$) and alcohol abuse ($\beta = -0.522$; $p = 0.009$) were associated more with males than with females. As a final point of comparison, women started gambling later in life ($\beta = 0.086$; $p = 0.014$) than men.

Table 3. Clinical predictors of PG severity in the multiple linear regression (overall sample)

	Unstandardized coefficients		Standardized coefficient β	T	p	R ²
	B	SE				
Anxiety (STAI-T)	0.034	0.039	0.116	0.864	0.390	0.141
Impulsivity (BIS-10)	0.055	0.022	0.265	2.437	0.017	
Maladjustment (EI)	0.105	0.051	0.222	2.042	0.045	
Depression (BDI)	-0.024	0.045	-0.095	-0.534	0.595	
Gender	-0.573	0.726	-0.087	-0.790	0.432	

Dependent variable: score in the SOGS. SE = Standard error.

Table 4. Gambling predictors of PG severity in the multiple linear regression (overall sample)

	Unstandardized coefficients		Standardized coefficient β	T	p	R ²
	B	SE				
Gambling-related thoughts (IGRT)	0.120	0.109	0.130	1.105	0.273	0.129
Age at onset – gambling	-0.118	0.052	-0.469	-2.270	0.027	
Age at onset – disorder	0.073	0.050	0.277	1.461	0.149	
Duration of gambling disorder (years)	0.005	0.004	0.150	1.161	0.250	
Sex	-0.342	0.820	-0.053	-0.417	0.678	

Dependent variable: score in the SOGS. SE = Standard error.

Discussion

This study set out to analyze the predictors of PG severity in a sample of pathological gamblers seeking treatment. An added value of this research is to have a homogeneous sample concerning gender (50% female), which is very rare in previous research.

The sociodemographic, clinical and gambling factors associated with PG severity were analyzed. No association was found between sociodemographic variables and PG severity. Regarding personality, clinical and gambling factors, in the multiple linear regression analysis, impulsivity, maladjustment in everyday life and age at gambling onset predicted PG severity in the overall sample.

Likewise, the predictors of PG severity according to sex were analyzed. The duration of gambling disorder was the only predictor of PG severity for female gamblers, while impulsivity (a risk factor) and depression (a risk marker) predicted PG severity in male gamblers.

In terms of gender differences in the subgroup of more severe pathological gamblers, older age, later age at gam-

bling onset and a greater family support were associated with female gamblers. In turn, a low self-esteem and alcohol abuse were associated with male gamblers.

The main findings indicate that impulsivity was a strong predictor of PG severity. These results provide support for other studies that have found a clear relationship between greater PG severity and high rates of impulsivity [24, 51, 52]. The personality trait of impulsivity plays a major role in the development of PG, and it is one of the key components in other impulse control disorders. Inability to control impulses and also inability to delay gratification are two major impulsivity-related symptoms found in pathological gamblers [53]. The association between early onset and greater PG severity could be related to the theoretical model of Cloninger postulating two different types of alcohol-dependent patients (type I and type II). Anyway, further research is required to draw any definitive conclusion about it.

Regarding gambling predictors, the age at gambling onset has often been identified as a possible risk factor for PG [54, 55]. According to other studies, a younger age at

onset is related to greater PG severity [56–59] and may be a risk factor for severity of psychiatric, family, social problems and for substance abuse. Likewise, early-onset gamblers experienced greater gambling intensity and more severe medical and psychiatric problems than later onset gamblers [56, 57]. Specifically, pathological gamblers who began gambling during preadolescence were more at risk of developing a gambling disorder and related problems later in life, than those who began gambling during adolescence and adulthood [57, 60, 61]. Because gambling is widespread in today's society, an increased proportion of adolescents and young adults may initiate gambling activities at earlier ages [62–64]. These results suggest that age at gambling onset may be a risk factor for severity of PG and highlight the need to focus on prevention and treatment interventions.

Maladjustment in everyday life also predicted PG severity in gamblers. In men as in women PG involves negative consequences in different areas of life (i.e. social, work, financial and family). Social isolation is related to shame and debts to acquaintances. There is a lower work involvement, with absences and layoffs. The financial area is one of the most affected by the gambling with a significant decline in purchasing power, with many debts and other economic problems. Legal implications related to the gambling are usually associated to different kinds of crimes (i.e. embezzlement or theft), which are motivated by the gambler's need for money to continue gambling. Finally, a gambler's family (partner and children) are suffering the greatest impact [19, 20].

One of the main findings of the study is related to predictors of PG severity according to sex. Gender-related differences in pathological gamblers have previously been found in demographics and gambling measures, as well as in psychological functioning and motivation for treatment [19, 20]. Although certain predictors were common to both men and women, there were gender differences in terms of PG severity. According to other studies [13, 65, 66], depression is a predictor of PG severity in men. There is no common consensus on whether patients suffer from depression before or after their gambling problem. It has been suggested that gambling can serve to enhance mood [67]. However, other authors have argued that depression arises as result of gambling-related problems [68], which would explain the higher incidence of depressive symptoms, suicidal ideation and suicide attempts in this group [69, 70].

For female gamblers, duration of gambling disorder was the only predictor of PG severity. Early-onset gamblers had participated in gambling activities for a greater

number of years, which may be associated with the development of psychiatric problems over the course of their lifetimes [57]. The development of disorder in women is faster when they have to cope with adverse life circumstances, such as loneliness or problems with couple or children. Thus, PG usually appears in women in middle age or late life, controlled by negative reinforcement (avoidance of emotional distress and escape from everyday frustrations). A faster progression to PG also occurs when women lack self-management, communication and problem solving skills or when they have few resources to cope with psychological stress situations, most of all if the social support is low and the use of leisure time is unsatisfactory [19, 20].

Finally, with regard to gender differences in a subgroup of more severe pathological gamblers, female gamblers were older than male gamblers and started gambling later in life, but became dependent on gambling more quickly. This difference in the progress of the disorder (the telescoping effect) has also been found in other studies related to gambling [14–17, 21], but it is not so clear in the case of alcohol dependence [71]. The explanation of the telescoping effect is controversial. Several studies have justified these findings on the basis of sociocultural [72], psychopathological [73] or even neurobiological factors [66].

Family support was associated with female gamblers in the more severe subgroup. Although female gamblers may fall into social isolation more often than men, one reason for this controversial finding might be that the family in Spain is a powerful network and women have stronger bonds with relatives than men [19].

Alcohol abuse was associated with the subgroup of severe male gamblers. Alcohol abuse is a common comorbid problem related to PG, and numerous studies have reported that there is a comorbid problem more frequent in male gamblers than in female ones [13, 15, 17, 64, 74–78]. In fact, there is more genetic vulnerability to alcohol dependence and gambling in men [79], which is related to impulsivity in male gamblers. Impulsive behavior leads them to gambling more, to have higher economic losses and more legal problems related to gambling [21, 80].

Although in general low self-esteem is more likely to be associated with female gamblers [15, 21, 81], in the subgroup of more severe gamblers this variable was associated with men.

The limitations of this study should be considered when interpreting the findings. First, the relatively small sample size precludes a definitive conclusion about the predictors of PG severity, so this should be expanded to

give the study more weight. Second, methodologically it is important to keep in mind that treatment seekers might not be representative of gamblers in the general population. Third, a more comprehensive assessment of mental symptoms and comorbid disorders needs to be carried out in future research. Fourth, the self-reported nature of the data can lead to bias because pathological gamblers have poor recall of their early gambling behavior. Since it is not always easy to have external sources of information, it would be good to have a further replication of this study. Finally, since this study is cross-sectional, longitudinal studies are needed to examine predictors of PG severity and to find out what kind of factors related to gambling (e.g. depression or irrational beliefs) contribute to cause problem gambling.

Conclusions

In summary, the aim of this study is to contribute to the identification of factors that may be associated with PG severity taking gender differences into account: duration of the disorder in women and impulsivity and depression in men. In a subgroup of more severe gamblers, the differences by sex were: older age, age at gambling onset and family support in female gamblers; low self-esteem and alcohol abuse in male gamblers. It is important to examine the impact of these factors on the severity of PG, and thus be able to tailor treatment to specific

patient needs according to gender and individual characteristics [82]. In particular, future research should examine gambling behaviors alongside psychological functioning and suggest treatment approaches to address specific goals according to these gender-related differences. Different treatment and prevention measures might be called for. Thus, a PG treatment program for men should include some additional components to deal with depression/low self-esteem or alcohol abuse or to cope with impulsivity; in turn, the therapeutic approach to women with PG should pay attention to the early treatment of gambling dependence, as well as to the control of the telescoping effect.

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