



P-ISSN: 2789-1623  
E-ISSN: 2789-1631  
IJRP 2023; 3(1): 19-24  
Received: 04-05-2023  
Accepted: 11-06-2023

**Hani Raoul Khouzam**

<sup>1)</sup> Psychiatrist, Rural Mental Health Clinic - VA Central California Health Care System (VACCHCS), Fresno, California and VA Palo Alto Health Care System, Palo Alto, California

<sup>2)</sup> Health Sciences Clinical Professor of Psychiatry, University of California San Francisco (UCSF) - Fresno Medical Education Program, Fresno, California

**Correspondence Author;**  
**Hani Raoul Khouzam**

<sup>1)</sup> Psychiatrist, Rural Mental Health Clinic - VA Central California Health Care System (VACCHCS), Fresno, California and VA Palo Alto Health Care System, Palo Alto, California

<sup>2)</sup> Health Sciences Clinical Professor of Psychiatry, University of California San Francisco (UCSF) - Fresno Medical Education Program, Fresno, California

## Identification, epidemiology, etiology, and treatment of gambling disorder

**Hani Raoul Khouzam**

**DOI:** <https://doi.org/10.22271/27891623.2023.v3.i2a.40>

### Abstract

**Introduction:** Gambling is a complex mental disorder with social and economic impacts. The lifetime prevalence rate of gambling disorder in the general U.S. population is about 0.4%–1.0%. In clinical settings the diagnosis of gambling disorder could be missed and untreated leading to worsening of functioning and impacting individuals with gambling disorder their families and the society at large.

**Objectives:** To summarize the diagnosis, etiology, epidemiology, the social and economic impacts and the currently available treatment interventions in gambling disorder.

**Material and Methods:** Data were gathered from a systematic literature review, search of the PubMed electronic database, PsycINFO and the Cochrane Systematic Review Database.

**Results:** The etiology of gambling disorder is complex, and not fully understood with possible genetic and environmental influences. Alteration in the cortico-striato-limbic systems and their circuits are also implicated as possible etiological factors of gambling disorder. Gambling disorder frequently co-occurs with other psychiatric conditions, particularly substance use disorders. Cognitive behavioral therapy, motivational interviewing and gambling anonymous are considered beneficial interventions in gambling disorder. Although the US Food and Drug Administration (FDA) has not approved a pharmacological intervention for the treatment of gambling disorder, limited data suggest promising beneficial effects from the use of opioid antagonists, antidepressants, mood stabilizers, antiepileptics, atypical antipsychotics, and glutaminergic agents in the treatment of gambling disorder. More and larger randomized and placebo controlled clinical trials with longer-term evaluation periods are still needed to confirm the effectiveness and the long-term efficacy of these pharmacological agents.

**Discussion and Conclusion:** Gambling is considered a complex mental disorder that affect many individuals along with their families and society at large. Its identification and diagnosis is still lacking in clinical settings Cognitive behavioral therapy, motivational interviewing and attendance of gambler anonymous are considered valuable therapeutic intervention. Pharmacological interventions are still in their early investigational stages and are not yet recommended as evidence-based treatment modalities until confirmed by the conduction of larger randomized and placebo controlled clinical trials with longer-term evaluation periods. Clinicians need to acquire the necessary knowledge to accurately diagnose gambling disorder as described in The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR).

**Keywords:** Gambling disorder, addiction, psychotherapy; psychopharmacology, treatment, gamblers anonymous

### Introduction

Gambling disorder (GD) is a common and disabling psychiatric condition that is characterized by intrusive urges to engage in detrimental gambling activities <sup>[1]</sup>. It is considered a complex mental disorder that is manifested by repeated patterns of excessive gambling expenditure resulting in impaired personal, familial, vocational and educational functioning, leading to emotional distress, social consequences and financial devastation for gambling individuals, their families and the society at large <sup>[2]</sup>. Individuals who develop GD develop an addiction to their gambling activities which then take control of their life, consume their time, and deplete their finances <sup>[2]</sup>. Despite the significant negative impact on the personal, social, and financial resources, individuals with GP are unable to refrain or abstain from pursuing their gambling activities <sup>[1, 2]</sup>. Individuals with GD develop impairment in their social, interpersonal and vocational functioning with frequent absence from work, poor job performance and loss of employment <sup>[3]</sup>. Marital problems loss of intimacy and mistrust between family members are also common complications of GD <sup>[4]</sup>.

Deterioration of physical and mental health and increased use of medical services have been reported in individuals with GD [5]. Psychiatric disorders and particularly substance use disorders frequently co-occur with GD [6]. The purpose of this article is to summarize the diagnosis, epidemiology, etiology, and treatment of GD.

### Diagnosis

According to The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR) [7], GD has been classified as a substance-related disorder, mirroring the classification system used for substance use disorders as summarized in Table 1 [1].

### Gambling disorder diagnostic criteria

1. Persistent and recurrent problematic gambling behavior leading to clinically significant impairment or distress, as indicated by the individual exhibiting four (or more) of the following in a 12-month period.
1. Needs to gamble with increasing amounts of money to achieve the desired excitement.
2. Is restless or irritable when attempting to cut down or stop gambling.
3. Has made repeated unsuccessful efforts to control, cut back, or stop gambling.
4. Is often preoccupied with gambling (e.g., having persistent thoughts of reliving past gambling experiences, handicapping, or planning the next venture, thinking of ways to get money with which to gamble).
5. Often gambles when feeling distressed (e.g., helpless, guilty, anxious, depressed).
6. After losing money gambling, often returns another day to get even ("chasing" one's losses).
7. Lies to conceal the extent of involvement with gambling.
8. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling.
9. Relies on others to provide money to relieve desperate financial situations caused by gambling.
10. The gambling behavior is not better explained by a manic episode.

### Epidemiology

The prevalence of GD has been estimated to be about 0.2%–0.3% in the general U.S. population [8]. A higher estimated range of 0.1%–0.7% in other countries [9]. The lifetime prevalence rate of GD In the general U.S. population is about 0.4%–1.0% [10]. The lifetime prevalence rate of GD women is about 0.2%, and for men is about 0.6% [11]. The 12-month prevalence of GD is different among the various ethnic and racial groups and is estimated to be 0.52% in African Americans, 0.25% in Latinx, and 0.23% in non-Latinx Whites [12].

### Etiology

The cause of GD is still unknown and has been postulated to be due the result of complex interactions between genetic and environmental factors, with a more frequent occurrence in monozygotic than in dizygotic twins [13]. First-degree relatives of individuals with moderate to severe alcohol use disorder have a higher prevalence of GD when compared with the general population [14]. The pathophysiology of GD has also been attributed to alteration in the brain cortico-

striato-limbic structures and circuits [15]. The nigrostriatal pathway [16], the hypothalamic–pituitary–adrenal (HPA) axis [17], the insula [18], and multiple prefrontal cortex (PFC) regions [19] have been implicated in the development and progression of addictive behaviors including gambling.

### Clinical concerns

In clinical settings the diagnosis of GD could be missed and untreated due to either omission by the individuals who may not report it as distressing condition or due to lack of its inclusion in various screening questionnaires [20]. Several reports describe GB to be associated with poor physical health and co-occurring medical conditions such as increased body weight, diabetes, tachycardia, angina, migraine, and intestinal disorders [21, 23]. Other psychiatric disorders frequently co-occur with GD, such as depressive disorders, anxiety disorders, personality disorders and particularly substance use disorders [6, 23, 24]. Bipolar disorder, obsessive compulsive disorder (OCD) attention-deficit hyperactivity disorder (ADHD) and posttraumatic stress disorder (PTSD) have also been reported in individuals with GD [25, 26]. Higher rates of suicide and premature death have also been reported in patients with GD [27, 28]. GD has also been associated with higher rates of homelessness [29].

### Economic and Social impact

There seems to be a global rising trend to legalize gambling by promoting it as a major source of tax revenues from casinos and multimillions lotteries [30]. Gambling facilities attract tourism and could contribute to the local economy by creating employment opportunities [31]. Additionally gambling casinos premium entertainments in live concerts and shows with famous singers, artists, and their provision of lavish dining. Despite these presumed benefits of legal gambling, it is associated with many negative and harmful outcomes such as the erosion of family cohesiveness and due its self-absorbing, gambling contributes to an increased sense of isolation, loneliness, disharmony, division and heightened interpersonal, marital, familial conflicts, domestic violence, bankruptcy, and criminal offences [32]. The state-to-state spread of online gambling has also been associated with financing of criminal activities, money laundering and even the funding of terrorist organizations [33]. Gambling has also been associated with higher rates of homelessness [34]. The financial harm associated with gambling have the most detrimental effect on those who have the least financial resources and consequently the poorer of the society seem to carry a higher burden of the economic cost of gambling [35]. Therefore, gambling may contribute to a rise in inequality and poverty affecting the most disadvantaged of the society [36]. Uncontrolled gambling would eventually cause the development of gambling addiction and GD [37]. If unrecognized and left untreated, gambling addiction would precipitate a steady decline in productivity, unsurmountable debts, and financial ruins [38].

**Treatment:** Several interventions have been proposed for the treatment of GD including psychotherapy, psychopharmacology and gambling anonymous attendance.

**Psychotherapy:** Cognitive behavioral therapy (CBT), and motivational interviewing, have shown usefulness in the

treatment of GD.

### **Cognitive behavioral therapy (CBT)**

CBT utilizes techniques that focus on identifying and modifying faulty thought patterns and altered behaviors [15]. CBT goals are aimed at stopping gambling behavior by acquire specific skills, and by using exercises introduced in each therapy session. An essential component of CBT is homework assignments that are implemented to facilitate practice and reinforcement of the skills that were learned and acquired during each week's session. Treatment provides an overall framework of introducing daily lifestyle changes and restructuring an environment that foster and implement reinforcement of non-gambling behaviors. During the CBT sessions, the psychotherapist along with the patient track the days that were spent in gambling and the days that were spent in non-gambling activities [39]. Patients are also instructed and, encouraged to reward themselves for non-gambling activities [40].

### **Motivational interviewing (MI),**

The principles of MI are based on transforming the person's ambivalence about the need to stop gambling into a powerful motivation to permanently abandoning gambling and acquiring intrinsic motivations to counteract the urges to gamble [41]. The use of MI in GD can be implemented in a variety of interventions that would encompass treatment delivery, preparation for treatment, brief treatment intervention and, as a component of a comprehensive treatment plans specially in patients who are reluctant or avoiding active treatment [42].

The combination of CBT and MI in group settings or in individual sessions have also been effective in the treatment of GD [43].

### **Psychopharmacology**

Although the US Food and Drug Administration (FDA) has not approved any particular pharmacological intervention for the treatment of GD clinicians should consider pharmacotherapy for any co-occurring psychiatric conditions with a particular emphasis on the treatment of co-occurring substance use disorders [44].

**Opioid antagonists:** Few randomized controlled trials have shown opioid antagonists, such as naltrexone to be a promising agent in the pharmacological treatment of GD [45]. Future trials are still needed to reflect the heterogeneity of GD and to determine the factors that predict a sustained remission with naltrexone treatment [45]. Another opioid antagonist alverine was also used for the treatment of GD and showed some good response in reducing the severity of GD [46]. In addition to the opioid antagonists, studies have shown beneficial effects of various antidepressants, mood stabilizers, antiepileptics, atypical antipsychotics, and glutamatergic agents in the treatment of GD.

### **Serotonin specific reuptake inhibitors (SSRIs) antidepressants**

The SSRIs fluvoxamine [47, 48], paroxetine [49], sertraline [50], fluoxetine [51], citalopram, [52] and escitalopram [53]. Despite these preliminary findings about the efficacy of SSRIs in the treatment of GD, more randomized placebo-controlled and maintenance trials are still needed to confirm these findings and to determine whether improvement would persist for

prolonged periods of time.

### **Other antidepressants**

Preliminary results suggest that bupropion [54], nefazodone [55] and clomipramine [56] may be effective in reducing the urges to gamble and are well tolerated agents, however these findings are yet to be replicated or conducted in larger controlled trials.

### **Mood stabilizers and antiepileptics**

Lithium as a mood stabilizer was found to be effective in reducing gambling and mood instability in patients with GD and co-occurring bipolar disorder [57]. It is still unclear if lithium would show the same effects if used in GD in the absence of bipolar disorder.

The antiepileptic's carbamazepine [58], ox carbamazepine [59], and topiramate [60] were also described in a small number of studies to be beneficial in the treatment of GD.

### **Atypical, Second-Generation antipsychotics (SGAs)**

The SGAs risperidone [51, 61], and olanzapine [62, 63, 64] were found to be beneficial in certain individuals with GD and to have negative effects in other individuals a high discontinuation rate. These findings suggest that these agents may not be effective in the treatment GD but could be beneficial in certain individuals with GD and co-occurring psychiatric conditions. The use of SGAs in the treatment of GD needs to be explored in more studies prior to its acceptance as an optional pharmacological treatment for GD.

### **Glutamatergic agents**

Few clinical trials and case series used glutamatergic drugs such as N-acetylcysteine, memantine, amantadine, topiramate, acamprosate, baclofen, gabapentin, pregabalin, and modafinil in the treatment of GD [65]. These studies suggest that altering the glutamatergic system could play a role in the treatment of GD [65]. However many more randomized trials of these glutamatergic drugs are still lacking in confirming their efficacy [65, 66].

Despite the promises offered by the pharmacological treatment of GD, these findings are not considered evidence based until their proven effectiveness is confirmed in larger randomized clinical trials that also confirm their longer term and sustained beneficial effects [63].

In clinical practice the combination of pharmacotherapy and psychotherapy are usually recommended to achieve remission and to prevent GD relapses although, further research is needed to confirm these clinical outcomes [67].

### **Gamblers Anonymous (GA)**

Some individuals with GD found the attendance of GA to be beneficial in helping the participants meet and share the negative impact of gambling on their daily functioning and on their family and community [68]. The effectiveness of the 12- spiritual steps of GA in sustaining abstinence from gambling was reported by its participants to be related to its emphasis on patience, and its use of the Serenity Prayer as a pathway toward the acceptance of the identity of being addicted to gambling and the personal responsibilities with the assistance of other group members to achieve recovery and freedom from this controlling addiction. There still a need for large-scale randomized controlled trials to determine GA's effectiveness, as well as research exploring

the mechanisms through which GA works, and to identify the barriers that prevent GA from achieving a sustained remission from gambling [69].

### Discussion and Conclusion

Gambling disorder is a psychiatric condition that is characterized by a persistent, recurrent pattern of gambling activities that affects daily functioning and causes an increased level of distress and eventually resulting in financial ruins with a negative societal and economic impacts. The prevalence of gambling disorder has been estimated to be about 0.2%-0.3% in the general U.S. The etiology of gambling disorder is complex, and not fully understood with genetic and environmental influences. Neurobiological studies identified alteration in the cortico-striato-limbic systems and their circuits as possible etiological factors of gambling disorder. In clinical settings individuals with gambling disorder are often missed and unrecognized and thus untreated which behoove clinicians to accurately identify it as described in The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR). Gambling disorder frequently co-occurs with other psychiatric conditions, particularly substance use disorders. The accurate diagnosis of gambling disorder is an essential component of identifying it as a disabling condition that requires an immediate intervention. Psychotherapy especially cognitive behavioral therapy and motivational interviewing are considered beneficial interventions in the treatment of gambling disorder. Gamblers Anonymous has also been helpful in providing a forum for individuals to meet and support each other in their efforts to abstain from gambling activities. There is no current pharmacological treatment that has been approved for the treatment of gambling disorder, clinical trials have identified opioid antagonists, antidepressants, mood stabilizers, antiepileptics, atypical antipsychotics, and glutamergic agents as promising interventions in the treatment of gambling disorder. More and larger randomized and placebo controlled clinical trials with longer-term evaluation periods are still needed to confirm the effectiveness and the long-term efficacy of these pharmacological agents. The purpose of this article is to familiarize clinicians with the diagnosis, the epidemiology, the etiology, and the treatment of gambling disorder so that it can be accurately identified and promptly treated to prevent the detrimental effects of this addictive disorder on individuals and the society at large.

### Conflict of Interests

The materials described in this article are those of the authors and do not reflect the views of the Department of Veterans Affairs, the VA Central California Health Care System, the VA Palo Alto Health Care System or the UCSF Fresno Medical Education Program, California.

### Acknowledgements

Sincere appreciation, thankfulness and gratitude to family, friends and colleagues for their support and encouragement.

### References

- Grant JE, Odlaug BL, Schreiber LR. Pharmacological treatments in pathological gambling. *Br J Clin Pharmacol*. 2014 Feb;77(2):375-81.
- Hodgins DC, Stea JN, Grant JE. Gambling disorders. *Lancet*. 2011;378:1874-1884.
- Gerstein D, Murphy S, Toce M, *et al*. Gambling Impact and Behavior Study: Final Report to the National Gambling Impact Study Commission. Chicago, IL: National Opinion Research Center (NORC); c1999.
- Grant JE, Kim SW. Demographic and clinical characteristics of 131 adult pathological gamblers. *J Clin Psychiatry*. 2001;62:957-962.
- Pietrzak RH, Molina CA, Ladd GT, *et al*. Health and psychosocial correlates of disordered gambling in older adults. *Am J Geriatr Psychiatry*. 2005 Jun;13(6):510-9.
- Gerdner A, Håkansson A. Prevalence and comorbidity in a Swedish adolescent community sample - gambling, gaming, substance use, and other psychiatric disorders. *BMC Psychiatry*. 2022 Sep 6;22(1):594
- American Psychiatric Association (APA) Diagnostic and statistical manual of mental disorders: DSM-5-TR. Washington, D.C: American Psychiatric Association; c2022.
- Petry NM, Stinson FS, Grant BF. Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry*. 2005;66(5):564-574.
- Petry NM, Zajac K, Ginley MK. Behavioral addictions as mental disorders: To be or not to be? *Annu Rev Clin Psychol*. 2018;14:399-423.
- Petry NM, Ginley MK, Rash CJ. A systematic review of treatments for problem gambling. *Psychol Addict Behav*. 2017 Dec;31(8):951-961.
- Blanco C, Hasin DS, Petry N, *et al*. Sex differences in subclinical and DSM-IV pathological gambling: results from the national epidemiologic survey on alcohol and related conditions. *Psychol Med*. 2006;36(7):943-953.
- Petry NM, Blanco C, Jin C, Grant BF. Concordance between gambling disorder diagnoses in the DSM-IV and DSM-5: Results from the national epidemiological survey of alcohol and related disorders. *Psychol Addict Behav*. 2014;28(2):586-591.
- Eisen SA, Lin N, Lyons MJ, *et al*. Familial influences on gambling behavior: An analysis of 3359 twin pairs. *Addiction*. 1998;93(9):1375-1384.
- Slutske WS, Eisen S, True WR, *et al*. Common genetic vulnerability for pathological gambling and alcohol dependence in men. *Arch Gen Psychiatry*. 2000;57(7):666-673.
- Potenza MN, Balodis IM, Derevensky J, *et al*. Gambling disorder. *Nat Rev Dis Primers*. 2019 Jul 25;5(1):51.
- Wise RA. Roles for nigrostriatal-not just mesocorticolimbic: Dopamine in reward and addiction. *Trends Neurosci*. 2009 Oct;32(10):517-24.
- Zhou Y, Proudnikov D, Yuferov V, Kreek MJ. Drug-induced and genetic alterations in stress-responsive systems: Implications for specific addictive diseases. *Brain Res*. 2010 Feb 16;1314:235-52.
- Naqvi NH, Bechara A. The hidden island of addiction: the insula. *Trends Neurosci*. 2009 Jan;32(1):56-67.
- Volkow ND, Baler RD. Addiction science: Uncovering neurobiological complexity. *Neuropharmacology*. 2014 Jan;76 Pt B(0 0):235-49.
- Currie SR, Miller N, Hodgins DC, Wang J. Defining a threshold of harm from gambling for population health surveillance research. *Int Gambl Stud*. 2009;9(1):19-38.



21. Morasco BJ, Pietrzak RH, Blanco C, *et al.* Health problems and medical utilization associated with gambling disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychosom Med.* 2006;68(6):976-984.
22. Ford M, Håkansson A. Problem gambling, associations with comorbid health conditions, substance use, and Behavioural addictions: Opportunities for pathways to treatment. *PLoS One.* 2020 Jan 10;15(1):e0227644.
23. Bischof A, Meyer C, Bischof G, *et al.* Comorbid Axis I-disorders among subjects with pathological, problem, or at-risk gambling recruited from the general population in Germany: Results of the PAGE study. *Psychiatry Res.* 2013 Dec 30;210(3):1065-70.
24. Dash GF, Slutske WS, Martin NG, *et al.* Big Five personality traits and alcohol, nicotine, cannabis, and gambling disorder comorbidity. *Psychol Addict Behav.* 2019 Jun;33(4):420-429.
25. Dell'Osso B, Allen A, Hollander E. Comorbidity issues in the pharmacological treatment of Pathological Gambling: a critical review. *Clin Pract Epidemiol Ment Health.* 2005 Oct 10;1:21.
26. Chou KL, Afifi TO. Disordered (Pathologic or Problem) gambling and Axis I psychiatric disorders: Results from the national epidemiologic survey on alcohol and related conditions. *Am J Epidemiol.* 2011; 173(11):1289–1297.
27. Marionneau V, Nikkinen J. Gambling-related suicides and suicidality: A systematic review of qualitative evidence. *Front Psychiatry.* 2022 Oct 26;13:980303.
28. Armoon B, Griffiths MD, Mohammadi R, Ahounbar E. Suicidal behaviors and associated factors among individuals with gambling disorders: A Meta-Analysis. *J Gambl Stud.* 2023 Jun;39(2):751-777.
29. Vandenberg B, Livingstone C, Carter A, O'Brien K. Gambling and homelessness: A systematic review and meta-analysis of prevalence. *Addict Behav.* 2022 Feb;125:107151.
30. Rockloff MJ, Browne M, Russell AMT, *et al.* A Quantification of the net consumer surplus from Gambling Participation. *J Gambl Stud.* 2019 Dec;35(4):1147-1162.
31. Lee CK, Bernhard BJ, Kim J, *et al.* Differential gambling motivations and recreational activity preferences among casino gamblers. *J Gambl Stud.* 2015 Dec;31(4):1833-47.
32. Bergh C, Kühlhorn E. Social, psychological and physical consequences of pathological gambling in Sweden. *J Gambl Stud.* 1994;10(3), 275–285.
33. Arthur JN, Williams RJ, Belanger YD. The relationship between legal gambling and crime in Alberta. *Canadian Journal of Criminology & Criminal Justice.* 2014;56(1):49-84.
34. Vandenberg B, Livingstone C, Carter A, O'Brien K. Gambling and homelessness: A systematic review and meta: Analysis of prevalence. *Addict Behav.* 2022 Feb;125:107151.
35. Resce G, Lagravinese R, Benedetti E, Molinaro S.. Income-related inequality in gambling: Evidence from Italy. *Rev Econ Household.* 2019;17:1107-31.
36. Sulkunen P, Babor TF, Cisneros Ornberg J, *et al.* Setting limits. Oxford University Press; c2018.
37. Cowlshaw S, Kessler D. Problem gambling in the UK: implications for health, psychosocial adjustment and health care utilization. *Eur Addict Res.* 2016;22:90-98.
38. Lang KB, Omori M. Can demographic variables predict lottery and pari-mutuel losses? An empirical investigation. *J Gambl Stud.* 2009;25:171-83.
39. Petry NM. Pathological Gambling: Etiology, Comorbidity, and Treatment. Washington, DC: American Psychological Association; c2005.
40. Petry NM, Ammerman Y, Bohl J, *et al.* Cognitive-behavioral therapy for pathological gamblers. *J Consult Clin Psychol.* 2006;74:555-567.
41. Yakovenko I, Quigley L, Hemmelgarn BR, *et al.* The efficacy of motivational interviewing for disordered gambling: systematic review and meta-analysis. *Addict Behav.* 2015 Apr;43:72-82.
42. Bodor D, Ricijaš N, Filipčić I. Treatment of gambling disorder: Review of evidence-based aspects for best practice. *Curr Opin Psychiatry.* 2021 Sep 1;34(5):508-513.
43. Oei TP, Raylu N, Casey LM. Effectiveness of group and individual formats of a combined motivational interviewing and cognitive behavioral treatment program for problem gambling: A randomized controlled trial. *Behav Cogn Psychother.* 2010 Mar;38(2):233-8.
44. Giddens JL, Stefanovics E, Pilver CE, *et al.* Pathological gambling severity and co-occurring psychiatric disorders in individuals with and without anxiety disorders in a nationally representative sample. *Psychiatry Res.* 2012 Aug 30;199(1):58-64.
45. Victorri-Vigneau C, Spiers A, Caillet P, *et al.* Opioid Antagonists for Pharmacological Treatment of Gambling Disorder: Are they Relevant? *Curr Neuropharmacology.* 2018;16(10):1418-1432.
46. Grant JE, Potenza MN, Hollander E, *et al.* Multicenter investigation of the opioid antagonist nalmefene in the treatment of pathological gambling. *Am J Psychiatry.* 2006 Feb;163(2):303-12.
47. Hollander E, DeCaria CM, Mari E, *et al.* Short-term single-blind fluvoxamine treatment of pathological gambling. *Am J Psychiatry.* 1998 Dec;155(12):1781-3.
48. Hollander E, DeCaria CM, Finkell JN, *et al.* A randomized double-blind fluvoxamine/placebo crossover trial in pathologic gambling. *Biol Psychiatry.* 2000 May 1;47(9):813-7.
49. Kim SW, Grant JE, Adson DE, *et al.* A double-blind placebo-controlled study of the efficacy and safety of paroxetine in the treatment of pathological gambling. *J Clin Psychiatry.* 2002;63(6):501–7.
50. Saiz-Ruiz J, Blanco C, Ibáñez A, *et al.* Sertraline treatment of pathological gambling: a pilot study. *J Clin Psychiatry.* 2005 Jan;66(1):28-33.
51. Bai M, Huang E, Du H, *et al.* Fluoxetine combined with risperidone in treatment of online gambling disorder-case report. *Heliyon.* 2023 Feb 15;9(3):e13772.
52. Zimmerman M, Breen RB, Posternak MA. An open-label study of citalopram in the treatment of pathological gambling. *J Clin Psychiatry.* 2002 Jan;63(1):44-8.
53. Black DW, Shaw M, Forbush KT, Allen J. An open-label trial of escitalopram in the treatment of pathological gambling. *Clin Neuropharmacology.* 2007 Jul-Aug;30(4):206-12.
54. Black DW, Arndt S, Coryell WH, *et al.* Bupropion in the treatment of pathological gambling: a randomized,

- double-blind, placebo-controlled, flexible-dose study. *J Clin Psychopharmacology*. 2007 Apr;27(2):143-50.
55. Pallanti S, Baldini Rossi N, Sood E, Hollander E. Nefazodone treatment of pathological gambling: a prospective open-label controlled trial. *J Clin Psychiatry*. 2002 Nov;63(11):1034-9.
  56. Hollander E, Frenkel M, Decaria C, *et al.* Treatment of pathological gambling with clomipramine. *Am J Psychiatry*. 1992 May;149(5):710-1.
  57. Hollander E, Pallanti S, Allen A, *et al.* Does sustained-release lithium reduce impulsive gambling and affective instability versus placebo in pathological gamblers with bipolar spectrum disorders? *Am J Psychiatry*. 2005 Jan;162(1):137-45.
  58. Black DW, Shaw MC, Allen J. Extended release carbamazepine in the treatment of pathological gambling: An open-label study. *Prog neuro-psychopharmacology Biol Psychiatry*. 2008;32:1191–1194.
  59. Lin CC, Chao CY, Chang HA, *et al.* Oxcarbazepine for Gambling Disorder. *Am J Ther*. 2020 Sep-Oct;27(5):e524-e525.
  60. Goslar M, Leibetseder M, Muench HM, *et al.* Pharmacological treatments for disordered gambling: A Meta-analysis. *J Gambl Stud*. 2019 Jun;35(2):415-445.
  61. Seedat S, Kesler S, Niehaus DJ, Stein DJ. Pathological gambling behaviour: Emergence secondary to treatment of Parkinson's disease with dopaminergic agents. *Depress Anxiety*. 2000;11(4):185-6.
  62. McElroy SL, Nelson EB, Welge JA, *et al.* Olanzapine in the treatment of pathological gambling: A negative randomized placebo-controlled trial. *J Clin Psychiatry*. 2008 Mar;69(3):433-40.
  63. Dowling N, Merkouris S, Lubman D, *et al.* Pharmacological interventions for the treatment of disordered and problem gambling. *Cochrane Database Syst Rev*. 2022 Sep 22;9(9):CD008936.
  64. Fong T, Kalechstein A, Bernhard B, *et al.* A double-blind, placebo-controlled trial of olanzapine for the treatment of video poker pathological gamblers. *Pharmacol Biochem Behav*. 2008 May;89(3):298-303.
  65. Black DW, McNeilly DP, Burke WJ, *et al.* An open-label trial of acamprosate in the treatment of pathological gambling. *Ann Clin Psychiatry*. 2011 Nov;23(4):250-6.
  66. Nicola M, Ruggeri F, Conte G, *et al.* Targeting the glutamatergic system to treat pathological gambling: Current evidence and future perspectives. *Biomed Res Int*; c2014. p. 109786.
  67. Kraus SW, Etuk R, Potenza MN. Current pharmacotherapy for gambling disorder: A systematic review. *Expert Opin Pharmacotherapy*. 2020 Feb;21(3):287-296.
  68. Potenza MN, Balodis IM, Derevensky J, *et al.* Gambling disorder. *Nat Rev Dis Primers*. 2019 Jul 25;5(1):51.
  69. Schuler A, Ferentzy P, Turner NE, *et al.* Gamblers Anonymous as a Recovery Pathway: A Scoping Review. *J Gambl Stud*. 2016 Dec;32(4):1261-1278.

**Creative Commons (CC) License**

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**How to Cite This Article**

Khouzam HR. Identification, epidemiology, etiology, and treatment of gambling disorder. *International Journal of Research in Psychiatry*. 2023;3(1):19-24.