

Disordered Gambling and Its treatment

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Abstract

This paper describes the diagnostic criteria for pathological gambling and screening methods for identifying individuals with gambling problems. Problem and pathological gambling are more likely to occur in certain populations, such as among individuals with substance use disorders, psychiatric conditions, and medical problems. Despite the prevalence rate of this disorder, few pathological gamblers seek treatment. This paper reviews different forms of treatments that have been applied to gamblers, along with evidence of their efficacy. Clinical guidelines for identifying and treating gambling problems are outlined.

Key words: pathological gambling, problem gambling, treatment

With the increasing availability and access to gambling opportunities over the past few decades, clinical and research interest is growing in pathological gambling, along with the sub-diagnostic threshold condition known as problem gambling. This paper reviews criteria for a diagnosis of pathological gambling, as well as the epidemiology of the disorder. It also describes diagnostic and screening instruments for assessing pathological and problem gambling, along with their strengths and weaknesses. Gambling frequently occurs with other psychiatric conditions, and this paper also briefly reviews its comorbidity with substance use, mood and anxiety disorders. In addition, growing evidence indicates that pathological gambling is associated with medical problems and disorders. The final section of the paper focuses upon treatment modalities, along with recommendations for identifying and treating gamblers in practice.

I. Classification of problem and pathological gambling and presenting symptoms

Pathological gambling was first introduced in the Diagnostic and Statistical Manual of Mental Disorders, Revision III (DSM; American Psychiatric Association (APA), 1980) as a Disorder of Impulse Control, Not Elsewhere Classified. In DSM-IV (APA, 1994), pathological gambling remains in the impulse control section, although discussions are emerging about integrating it along with substance use disorders into an addictive disorders section (Petry, 2006). Currently, half of the 10 pathological gambling criteria parallel substance use disorder criteria: preoccupation with gambling or ways to get gambling money, increasing the frequency and/or amount of money wagered (tolerance), unsuccessful attempts to stop or reduce gambling, feeling restless or irritable when unable to gamble (withdrawal), and giving up other activities (social, work or recreational) because of gambling. The non-substance dependence oriented criteria for pathological gambling include chasing lost money, gambling to escape problems or negative

moods, lying to others to hide gambling, committing illegal acts to support gambling, and relying on others to relieve desperate financial situations. Endorsement of five or more of the above 10 criteria constitutes a diagnosis of pathological gambling.

These criteria have face validity, but they have been subjected to little psychometric testing. Only limited data exist about psychometric properties of the items themselves or number necessary to confer a diagnosis. In other words, it is not clear that 5 are needed for an individual to have a severe gambling problem, and a higher proportion of criteria need to be met for a diagnosis of pathological gambling (5 of 10 criteria) than for substance dependence (3 of 7).

In epidemiological studies, the most commonly endorsed symptoms by pathological gamblers are preoccupation with gambling, chasing losses, and lying to others about amounts gambled. Tolerance, escape and unsuccessful attempts to quit gambling are also fairly commonly reported criteria, while committing illegal acts to support gambling is the least often endorsed item (Blanco, Hasin, Petry, Stinson & Grant, 2006; Gerstein et al., 1999; Toce-Gerstein, Gerstein & Volberg, 2003). However, patterns of symptom endorsement vary somewhat across samples and instruments. For example, Gerstein et al. (1999), but not Blanco et al. (2006), found a high proportion of pathological gamblers endorsed the withdrawal criterion. Thus, more research is necessary to determine the most appropriate symptoms, the cutoffs for diagnoses, and methods for assessing the disorder.

As noted in the next section, prevalence rates depend in part on the classification systems used and instruments administered. The present DSM-based system for pathological gambling does not define a subthreshold condition, as exists for abuse and dependence. However, far more individuals have some, albeit not the full syndrome, of gambling problems. Throughout this paper, this subthreshold condition is referred to as “problem gambling,” typically comprising

individuals who endorse fewer than 5 pathological gambling symptoms. The term “disordered gambling” encompasses the combined group of both problem and pathological gamblers.

II. Epidemiology and prevalence rates in general populations

Four nationally-based studies evaluating the prevalence of disordered gambling have been conducted in the United States to date. The federal government commissioned the first of these in 1976, prior to the introduction of pathological gambling in the DSM. As such, it examined gambling behaviors and attitudes rather than diagnoses. Kallick, Suits, Dielman and Hybels (1976) conducted a telephone survey of 1,749 randomly selected adults, and reported that 0.8% had a significant lifetime gambling problem, and an additional 2.3% had moderate gambling problems. In the study conducted about 20 years later for the National Gambling Impact Study Commission (NGISC), Gerstein et al. (1999) surveyed 2,417 randomly selected residents by phone and similarly found a lifetime prevalence rate of pathological gambling of about 0.8%, with 1.3% having lifetime problem gambling. In that survey, past year rates were also evaluated, and 0.1% were current pathological gamblers with 0.4% current problem gamblers. In another phone survey of 2,638 adults, Welte, Barnes, Wieczork, Tidwell and Parker (2001) found lifetime prevalence rates of pathological and problem gambling of 2.0% and 2.8%, respectively, and past year rates of 1.3 and 2.2%. The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) is the most recent survey and also the largest to date (Petry, Stinson & Grant, 2005). It involved an in-person survey of over 43,000 randomly selected adults throughout the United States. The lifetime prevalence rate of pathological gambling was 0.4%.

Thus, the lifetime prevalence rate of pathological gambling varies from 0.4 to 2%, with past year rates being substantially lower. Some reasons for the varying prevalence rates across

studies relate to sampling error, sample size and instruments used. Smaller surveys are more likely to have wide confidence intervals, and only one of the surveys above was large enough to accurately estimate rates of a relatively low prevalence disorder. Furthermore, all the studies utilized different instruments to assess pathological gambling. In the Welte et al. (2001) survey, two instruments were administered to each respondent, and the two tools generated markedly different prevalence rates, with DSM-IV based instruments resulting in about half the prevalence rates relative to non-DSM-IV based surveys. The specific instruments used to assess disordered gambling are outlined in the next section, along with their strengths and weaknesses.

III. Instruments used to diagnose or classify problem and pathological gambling

A. SOGS

Table 1 below lists the instruments currently in use to assess gambling disorders. The most widely used screening instrument for assessing pathological gambling is the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987). The SOGS consists of 20 self-report items, and scores of five and higher indicate pathological gambling status, with scores of 3-4 generally indicative of problem gambling. An adolescent version of the SOGS is also available (Ladouceur, Ferland, Poulin, Vitaro, & Wiebe, 2005).

Despite its widespread use, the SOGS has been criticized for its high false positive rate. That is, it often identifies non-pathological gamblers as pathological, and even non-problem gamblers as having mild to moderate problems. However, in this regard, the SOGS may be useful for initial screening purposes. Those who endorse 3 or more items may subsequently be administered more extensive interviews regarding their gambling.

B. DSM-based instruments

There are several DSM-IV based measures, including the National Opinion Research Center DSM-IV Screen for Gambling Problems (NODS; Gerstein et al., 1999), the National Institute on Alcohol Abuse and Alcoholism Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV (AUDASIS; Petry et al., 2005), and the Canadian Problem

Table 1.

Instruments used for assessing gambling disorders

Instrument	Selected reference(s)	Items used in scoring	Additional items	Strengths	Weaknesses
South Oaks Gambling Screen (SOGS)	Lesieur & Blume, 1987	20	13 other items about types of gambling, etc.	Widely used screener. Short and easy to administer (self-report) and score.	High false positive rate; not based on DSM-IV criteria
National Opinion Research Center DSM-IV Screen for Gambling Problems (NODS)	Gerstein et al., 1999	17	N/A	DSM-IV based. Lifetime and Past year versions available. Used in one national epidemiological survey.	Not widely used; limited psychometrics published. Interviewer administered.
National Institute on Alcohol Abuse and Alcoholism Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV (AUDASIS)	Petry et al., 2005	15	N/A	DSM-IV based. Lifetime and Past year versions available. Used in one national epidemiological survey.	Not widely used; limited psychometrics published. Interviewer administered.
Canadian Problem Gambling Index (CPGI)	Ferris & Wynne, 2001; Ladouceur, et al., 2005	14	Extensive interview about gambling types, history, problems, etc.	Widely used in Canada. Extensive gambling history and problems can be assessed.	Lengthy if full battery is used; limited psychometrics published.
Addiction Severity Index (ASI)	Petry, 2003; Petry, 2007	5	Optional other gambling items, along with medical, employment, substance use, legal, family and psychiatric sections.	Gambling section is short, and easy to administer. Gauges changes in gambling behavior (\$, days) and problems over time. Assesses other areas of functioning. Widely used in drug abuse treatment.	Not diagnostic. Complex scoring procedure.

Gambling Index (CPGI; Ferris & Wynn, 2001). The NODS is an interviewer-administered questionnaire that assesses past-year and lifetime gambling problems. Each version contains 17 items comprising all 10 of the DSM-IV criteria, with some of the criteria asked in two different formats to ensure understanding. Scores of five and higher indicate pathological gambling status, with problem gamblers typically defined as those endorsing 3 or 4 items, but sometimes even affirming 1 item is considered problem gambling. The NODS identified 95% of treatment-seeking gamblers as pathological, and it has adequate reliability and validity (Gerstein et al., 1999; Hodgins, 2004).

The NESARC study (Petry et al., 2005) utilized a DSM-IV-based instrument called the AUDASIS. Fifteen symptom items operationalize the pathological gambling criteria, with two items inquiring about some criteria. Both lifetime and past year versions are available. As with the NODS, only limited data on its psychometric properties are available, but internal consistency of symptom items ($\alpha=0.92$) and criteria for pathological gambling ($\alpha=0.80$) are good.

The CPGI is contained within a larger instrument that examines participation in a range of gambling activities and associated problems. The diagnostic section consists of 14 items, 9 of which determine pathological gambling status. Like the NODS and AUDASIS, the CPGI has demonstrated acceptable psychometric properties and correlates with other problem gambling indices (Ferris & Wynn, 2001; Ladouceur, Jacques, Chevalier, Sévigny, & Hamel, 2005).

C. Quantity and frequency of gambling

Not surprisingly, pathological gamblers wager frequently and spend significant amounts of money gambling. Among gamblers entering treatment programs, for example, the mean days gambled in the past month is 14 and the median amount wagered exceeds \$1000 (Petry et al.,

2006). Some data suggest that gambling frequency exceeding 1-2 days per month, and 2-7% of one's income, is predictive of pathological gambling status (Currie, Hodgins, Wang, el-Guebaly, Wynne, & Chen, 2006; Weinstock, Ledgerwood & Petry, 2007).

However, the DSM criteria for pathological gambling, as with the substance use disorder criteria, do not inquire about frequency and quantity of the behavior, but rather adverse consequences. Ultimately, a screening tool that is based upon behaviors rather than just consequences, similar to the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) for alcohol screening, would be useful for some clinical settings. Such approaches toward assessment of gambling behaviors are also valuable for evaluating outcomes in response to interventions (Walker et al., 2006). The Addiction Severity Index (ASI; McLellan et al., 1985), the most commonly used instrument for assessing drug use and related problems in substance abusers, has been adopted for use with gamblers and appears to have adequate psychometric properties in this population as well (Petry, 2003a; Petry, 2007). The gambling section of the ASI inquires explicitly about recent gambling frequency and quantity, and scores are responsive to changes associated with treatment.

D. Practical issues in selecting screening and diagnosis instruments

The above instruments range in length from 5 items to extensive interviews (see Table 1). They require between 2 minutes to over an hour to administer. Some are designed to be self-report measures while others are administered by lay professionals or trained clinicians. Options to reduce assessment burden include using skip-out criteria such that individuals who respond negatively to a "gatekeeper" item, such as, "Have you ever placed five or more bets in a year?" are not administered the remainder of the items.

Asking about frequency of gambling upfront may be useful for identifying potential disordered gamblers, as those who report no or very limited gambling are unlikely to have clinically significant problems with gambling. However, while this practice decreases administration time, it may also hinder validity as some problem gamblers may go undetected. Importantly, in administering any questionnaire about gambling, one should be sure to define what is meant by gambling, including purchasing scratch and lottery tickets, and playing bingo for money. Many individuals may participate in these activities but not consider them gambling in the same way as sports betting or casino-style gambling. Clearly, inclusion of all forms of gambling in determining responses is necessary.

In addition to considering time and length of administration, some instruments described above have fairly easy and intuitive scoring methods, while others require training and interpretation. Some provide diagnoses, while others only indicate potential problems. The SOGS suffers from fairly high false positive rates, while other instruments, especially those that rely on strict DSM criteria, may miss individuals with mild to moderate gambling problems. In deciding upon the assessment to use, one should consider the goals of the screening and clinical setting.

IV. Comorbidities of disordered gambling and other psychiatric disorders

As noted earlier, prevalence rates of disordered gambling in the general population vary depending upon the methods used to assess it, but one relationship remains consistent across studies and instruments. Disordered gambling is significantly more likely to occur among individuals with psychiatric conditions than among persons without psychopathology. Three national studies of disordered gambling (Gerstein et al., 1999; Petry et al., 2005; Welte et al., 2001) not only assessed pathological gambling but also some other psychiatric conditions. As

detailed below, general population surveys in specific geographical regions and studies of treatment-seeking populations find evidence for high rates of comorbidity as well.

A. Comorbidity of gambling and substance use disorders

In the NGISC survey, Gerstein et al. (1999) found that 9.9% of those with lifetime pathological gambling also had a lifetime diagnosis of alcohol dependence, compared with 1.1% of non-gamblers. Welte et al. (2001) noted that an even higher percentage of lifetime pathological gamblers (25%) had current alcohol dependence, compared with 1.4% of non-gamblers. Similarly, the NESARC study (Petry et al., 2005) reported alcohol dependence was 5 times higher in pathological gamblers than non-pathological gamblers. In terms of other drug use disorders, Petry et al. (2005) found that pathological gambling increased the odds of an illicit drug use disorder by 4.4 fold, with 38.1% of lifetime pathological gamblers having one or more illicit substance use disorder, compared with 8.8% of non-gamblers.

High rates of comorbidities are noted in treatment-seeking samples as well. Shaffer, Hall, and Vander Bilt's (1999) meta-analysis provided estimates of rates of pathological gambling among substance abusers. In 18 surveys of adults in treatment for substance use disorders, lifetime rates of pathological gambling were estimated at 14%. In addition to this meta-analysis, many more recent individual studies are also available, so only a few of the larger ones are highlighted. Among 512 substance abusers, Cunningham-Williams, Cottler, Compton, Spitznagel and Ben-Abdallah (2000) reported pathological gambling was present in 10%. Langenbucher, Bavly, Labouvie, Sanjuan and Martin (2001) found 13% of 372 substance abusers gambled pathologically, and Toneatto and Brennan (2002) found 11% of 580 residential addictions treatment patients were pathological gamblers. In methadone samples, Feigelman, Kleinman, Lesieur, Milman and Lesser (1995) noted 7% of 220 patients gambled pathologically

while Spunt, Lesieur, Hunt, and Cahill (1995) reported rates of 16% in 167 methadone patients. These rates are substantially higher than the 0.4% to 2% prevalence of pathological gambling in general population surveys (Gerstein et al., 1999; Petry et al., 2005; Welte et al., 2001). Thus, these treatment data corroborate epidemiological data linking substance use disorders and pathological gambling.

The converse relationship has also been examined, and individuals seeking treatment for gambling have been classified as to whether or not they have a substance use disorder. Studies of Gambling Anonymous members (Linden, Pope, & Jonas, 1986) and gamblers seeking professional treatment (McCormick, Russo, Ramirez & Taber, 1984; Ibanez et al., 2001; Ladd & Petry, 2003; Mccallum & Blaszczynski, 2002; Specker, Carlson, Edmonson, Johnson, & Marcotte, 1996) ubiquitously found high rates of alcohol and other drug abuse and dependence. Thus, substantial evidence, and no contradictory data, indicates that substance use and gambling disorders co-occur.

B. Comorbidity of gambling and mood disorders

Only a few epidemiological studies, and only one of the national ones, evaluated the presence of other psychiatric disorders along with pathological gambling in the general population. The NESARC study found that rates of major depression were about three times higher in pathological gamblers relative to non-gamblers (Petry et al., 2005). In the Epidemiological Catchment Area survey conducted in the early 1980s, the St. Louis, MO, site included a module about pathological gambling. Cunningham-Williams, Cottler, Compton & Spitnagel (1998) found that being a problem or pathological gambler significantly increased the chances of having major depression by about 3 fold. In a survey from Edmonton, Canada, Bland Newman, Orn & Stebelsky (1993) found that 20.0% of pathological gamblers, compared with

only 12.4% of the non-pathological gamblers, met criteria for major depression, although this odds ratio was not statistically significant.

Dysthymia was significantly elevated in pathological gamblers in the NESARC study, with about a 3-fold elevated risk in pathological compared with non-gamblers (Petry et al., 2005). Bland et al. (1993) also found significantly higher rates of dysthymia in pathological gamblers compared with non-gamblers, with about a 4-fold increase. However, only trends of increased risk for dysthymia were noted in the Cunningham-Williams et al. (1998) study.

Bipolar disorder is generally considered an exclusionary criterion for pathological gambling, unless the two disorders occur independently. Neither Bland et al. (1993) nor Cunningham-Williams et al. (1998) found significantly elevated risk of bipolar disorder in pathological gamblers. However, in the much larger NESARC survey (Petry et al., 2005), rates of a manic episode were 8-fold higher in pathological gamblers compared with non-gamblers.

In treatment-seeking samples of gamblers, only a handful of studies have systematically examined rates of mood disorders. All these studies suffer from relatively small sample sizes, but they do point to high rates of depression among those who seek treatment for gambling. Four studies (Linden et al., 1986; McCormick et al., 1984; Ramirez, McCormick, Russo & Taber, 1983; Taber, McCormick & Ramirez, 1987) examined major depression in pathological gamblers treated in inpatient units; lifetime rates of major depression ranged from 32% to 76%. Specker et al. (1996) found that gamblers seeking outpatient treatment had about three times higher rates of major depression than non-pathological gambling matched controls; lifetime rates of major depression were 70% and 23%, respectively. Two studies (McCormick et al., 1984; Linden et al., 1986) also noted increased rates of hypomania (38%) and manic episodes or bipolar disorder (8-24%) in treatment-seeking gamblers. These rates are clearly higher than the

general population rates of mania and bipolar disorder (Regier et al., 1990), but they are confounded by the fact that most of these patients were receiving inpatient psychiatric treatment. Patients receiving outpatient treatment are likely to have less severe problems, and few studies of prevalence rates of mood disorders in outpatient gamblers exist. Nevertheless, the available data suggest a strong link between pathological gambling and mood disorders whether evaluating epidemiological or treatment-seeking samples.

C. Comorbidity of gambling and anxiety disorders

A few studies have examined the relationship between anxiety disorders and pathological gambling. The NESARC study compared rates of eight anxiety disorders in pathological gamblers and non-gamblers (Petry et al., 2005). Every anxiety disorder evaluated occurred at significantly higher rates in pathological gamblers, including generalized anxiety disorder, panic disorder with and without agoraphobia, specific phobias and social phobia, each with odds ratios greater than 3 for all these disorders. In other epidemiological studies, Cunningham-Williams et al. (1998) found that being a problem gambler significantly increased risk of phobias, but not any other anxiety disorders. Bland et al. (1993) found pathological gamblers were significantly more likely than non-problem gamblers to have any anxiety disorder, with rates of 26.7% versus 9.2%. Both Bland et al. (1993) and Cunningham-Williams et al. (1998) also noted an increased risk obsessive-compulsive disorder among pathological gamblers.

In terms of treatment-seeking gamblers, only three published studies exist, and all of them are quite small. Linden et al. (1986) found 4% of 25 Gamblers Anonymous members exhibited symptoms of social phobia, generalized anxiety disorder, or agoraphobia with panic disorder, 8% had simple phobia, and 16% had panic disorder. In Spain, Ibañez et al. (2001) found lifetime rates of any anxiety disorder of 7.2% in pathological gamblers compared with

4.3% in controls, but these rates did not differ significantly between the groups. Specker et al. (1996) likewise did not find statistically significant differences in a small sample of 40 outpatient gamblers compared with controls; rates of any anxiety disorder were 37.5% versus 22.5%. While these studies did not necessarily reveal significant differences between groups, the lack of statistical significance may be related to power. Overall, anxiety disorders appear to occur more frequently in pathological gamblers than in the general population, and the larger epidemiological studies show significant associations between gambling and anxiety disorders.

D. Comorbidity of gambling with medical disorders

Evidence is mounting that pathological gambling is also associated with certain medical disorders. For example, we have found that rates of disordered gambling are significantly higher among individuals with disabilities than in the general population (Morasco & Petry, 2006). Furthermore, gambling screening studies conducted in general practice medical clinics find that individuals identified with pathological gambling have poorer global health than their counterparts without gambling problems (Morasco, von Eigen, & Petry, 2006). Data from the NESARC study (Morasco, Pietrzak, Blanco, Grant, Hasin, & Petry, 2006) revealed that pathological gamblers have significantly elevated rates of tachycardia, angina, cirrhosis and other liver diseases relative to non-gamblers. Temporal and causal relationships between pathological gambling and these diseases remain to be determined, but they suggest that medical practitioners as well as substance abuse counselors and other mental health providers should consider screening for gambling problems.

IV. Treatments for disordered gambling

Research examining the efficacy of treatments for pathological gambling is at a relatively early stage. Below, psychosocial and pharmacological approaches toward treating pathological gambling are described along with the data available regarding their efficacy.

A. Natural recovery

As noted earlier, lifetime rates of problem and pathological gambling are higher than past year rates. Dividing past year rates by lifetime rates, and subtracting this value from one, is a common method for estimating the proportion of disordered gamblers who have overcome their problems with gambling. Across over 20 epidemiological studies, Hodgins, Wynne and Makarchuk (1999) estimated that 36-46% of pathological gamblers are in recovery or resolved gamblers. For problem gambling, resolution rates similarly ranged from 32-46%. In the NESARC and NGISC surveys, Slutske (2006) similarly found that about 36-39% of individuals with lifetime pathological gambling did not experience any past-year problems with gambling, even though only a very small percentage had ever sought formal treatment for gambling or attended a gambling self-help group.

B. Gamblers Anonymous

Among those who do seek treatment, Gamblers Anonymous (GA) is the most commonly utilized approach. GA is a 12-step support-group based on the principles of Alcoholics Anonymous. In many states, no specialized gambling treatment services are available, and individuals uncovered with pathological gambling when accessing other forms of treatment, or those who do attempt to seek gambling-specific services, are referred to GA.

Because it is a self-help organization, rigorous evaluation of the efficacy and even the effectiveness of GA is not available. The limited evidence available is mixed. Stewart and Brown

(1988) followed 232 individuals who attended GA at least once. One year after their initial meeting, less than 10% remained actively involved with GA, and only 8% maintained abstinence from gambling. As many as 22% dropped out of GA after their first meeting, and nearly 70% ceased attending by their tenth meeting. On the other hand, Petry (2003b) found more positive outcomes when GA attendance was encouraged along with professional gambling treatment. In a consecutive sample of over 300 patients attending outpatient gambling treatment programs, those who also attended GA were more likely to abstain from gambling two months into treatment (48%) than patients who did not attend GA (36%). However, such correlational findings do not imply causality, and GA attendance may serve as a proxy for treatment motivation, which is independently associated with outcomes (Petry, 2005b). More research is needed to examine the effectiveness of GA as a stand-alone intervention and when combined with professional therapy.

C. Pharmacotherapies

No medication is approved by the Food and Drug Administration for treatment of pathological gamblers. However, some recent investigations have begun to explore the efficacy of medications that generally fall into one of three categories: 1) opioid antagonists; 2) antidepressants; and 3) mood stabilizers.

Two **opioid antagonists** have been evaluated—naltrexone and nalmefene. Naltrexone inhibits dopamine neurons in key areas of the brain. It is approved for treating opioid and alcohol dependence, and it is theorized to reduce cravings and positive effects of gambling. Kim, Grant, Adson, and Shin (2001) enrolled 83 pathological gamblers in an 11-week double-blind, placebo-controlled trial. Using a subset of 45 patients who remained in the study past week 6 and who achieved naltrexone doses of 100mg/day or more for at least 2 weeks, naltrexone reduced overall

gambling symptoms, and naltrexone-treated patients were more likely rated as “much” or “very much” improved (75%) compared with patients in the placebo condition (24%).

Recently, Grant and colleagues (2006) conducted a 16-week, randomized, double-blind, placebo-controlled investigation of another opioid antagonist—nalmefene. Patients were randomly assigned to placebo, or 25 mg, 50 mg or 100 mg doses of nalmefene. When all nalmefene groups were combined for analysis, it resulted in greater decreases in gambling symptoms and urges compared with placebo. Overall treatment response was most pronounced for patients who received 25 mg doses (59% were “much improved” or “very much improved”), compared with 34% of those in the placebo group. Patients receiving 50 mg (48%) and 100 mg (42%) doses, however, were not significantly more likely to show improvement compared with placebo patients. Side effects were relatively common, and no effects on actual gambling behaviors (days or dollars wagered) were reported in either of these studies.

Several **antidepressant medications** have also been explored as potential medications for pathological gambling. While some trials suggest that these medications may be efficacious for treating gambling (Hollander, DeCaria, Finkell, Begaz, Wong, & Cartwright, 2000; Kim, Grant, Adson, Shin & Zaninelli, 2002), others found no beneficial effects (e.g., Saiz-Ruiz et al., 2005). One of the more rigorous studies conducted to date was a double-blind placebo-controlled study of paroxetine (Kim et al., 2002). Forty-five pathological gamblers participated in a 9-week trial. Patients receiving paroxetine experienced greater reductions in gambling problems and urges than patients in the placebo condition. Nearly 48% of patients in the paroxetine condition were rated as “very much improved,” compared with about 5% of the placebo patients. Another double-blind, placebo-controlled study examined the efficacy of fluvoxamine in 32 pathological gamblers over 6 months of treatment (Blanco, Petkova, Ibanez,

Saiz-Ruiz, 2002), but overall fluvoxamine was not related to greater improvement than placebo in this study.

Lithium and other **mood stabilizers** have also been studied in pathological gamblers who have co-occurring bipolar disorder symptoms (Hollander, Pallanti, Allen, Sood, & Rossi, 2005; Pallanti, Querciolo, Sood, & Hollander, 2002). In a recent double-blind, placebo-controlled study, 40 pathological gamblers with a bipolar spectrum disorder were randomized to receive sustained-release lithium carbonate or placebo for 10 weeks (Hollander et al., 2005), and 29 patients completed the trial. Lithium was associated with significant reductions in gambling symptoms, thoughts and urges. Of the patients who completed the entire course of treatment, more lithium-treated patients (83%) were rated as treatment-responders than placebo-treated patients (29%). Thus, lithium may be a useful treatment in pathological gamblers with co-occurring bipolar spectrum disorders, but more research is needed to further explore the efficacies of pharmacotherapies for treating pathological gambling in general, as well as among some subsets of patients.

D. Cognitive and cognitive-behavioral therapy

Cognitive and cognitive-behavioral therapy (CBT) approaches have empirical evidence of efficacy in treating pathological gamblers. Several independent research groups have found support for these interventions in decreasing gambling (e.g., Echeburua, Baez, & Fernandez-Montalvo, 1996; Ladouceur et al., 2001; Petry, et al., 2006; Sylvain, Ladouceur, & Boisvert, 1997). Although the treatments tested vary with respect to emphasis on cognitive and behavioral aspects, these interventions typically focus on identification of cognitive distortions about gambling (e.g., biased memories, illusions of control), reinforcement of non-gambling behaviors, encouragement of problem solving, social skills building and relapse prevention.

In the largest published study to date, Petry et al. (2006) randomized 231 pathological gamblers to one of three treatment groups: referral to GA, GA referral plus a self-directed CBT manual, or GA referral plus individual CBT. The manual and individual CBT consisted of eight chapters or sessions, covering various cognitive risk factors and behavioral coping skills. The session themes included: identifying gambling triggers, functional analysis of gambling triggers and consequences, planning alternative activities, trigger management, coping with cravings to gamble, assertiveness and gambling refusal skills, addressing gambling-related irrational thoughts and relapse prevention. Exercises are available, and descriptions of this therapy are provided in Petry (2005a). Gambling was reassessed at 1 month, 2 months, 6 months and 12 months after the baseline assessment, and collaterals provided independent assessments of the patients' gambling. Primary outcome variables included changes in gambling symptom severity scores (SOGS and ASI Gambling scale scores), days of gambling and money gambled. Using an intent-to-treat analysis, patients in the GA referral plus individual CBT condition had significantly greater improvement than patients in the GA referral only condition on all primary outcome measures. Individually delivered CBT was also associated with longer-term benefits relative to the other two conditions on some measures of gambling problem severity. A follow-up analysis (Petry, Litt, Kadden, & Ledgerwood, in press) found that these benefits, at least in the short-term, were mediated by improved coping skills acquisition among those receiving individual CBT.

Many of the exercises used in this CBT approach can incorporate issues relevant to both gambling and comorbidity disorders. For example, if drinking is a trigger for gambling, then scheduling alternative activities that do not involve either drinking or gambling would be important, and CBT may be particularly useful for patients with both substance abuse and

gambling problems. The work of Castellani, Wooten, Rugle, Wedgeworth, Prabucki, and Olson (1996) supports this idea. They reported that coping responses were poorer in substance abusers who also have a gambling problem relative to patients with only a substance use diagnosis. In the CBT trial above, patients with and without significant psychiatric symptoms were equally likely to respond to the therapy, suggesting its efficacy regardless of level of baseline psychopathology. Further research is necessary, however, to confirm these findings and to assess the short- and long-term efficacy of CBT in samples of treatment-seeking pathological gamblers as well as among substance abusers and patients with other psychiatric conditions who also have gambling problems.

E. Brief and motivational enhancement interventions

Brief interventions, consisting of 4 or fewer sessions, may be useful especially for less severe gamblers or for individuals seeking treatment for other disorders who are identified with gambling problems. An extensive cross-cultural literature suggests the efficacy of brief interventions in reducing heavy alcohol use (Babor, 1994; Chick, Ritson, Connaughton, & Stewart, 1998). The gambling treatment literature likewise suggests effectiveness of brief interventions (Dickerson, Hinchey, & England, 1990; Robson, Edwards, Smith, & Colman, 2002).

Motivational enhancement therapy (MET) is one such brief intervention that was developed for heavy alcohol drinkers (Miller & Rollnick, 1992). This treatment is based on the conceptualization that behavior change occurs through identifiable stages (precontemplation, contemplation, action and maintenance), and that motivation represents a state of readiness to change that can be influenced by use of stage-specific interventions (Prochaska & DiClemente, 1984). The therapist elicits the individual's understanding of the consequences of his or her substance use or gambling and strengthens commitment to change. MET techniques are

efficacious in reducing alcohol use among heavy drinkers (as reviewed in Miller et al., 1995), and reports describe the rationale behind the use of motivational techniques to treat gamblers (e.g., Dickerson et al., 1990; Hodgins, Currie, & El-Guebaly, 2001; Wulfert, Blanchard, & Martell, 2003).

Hodgins et al. (2001) randomly assigned 102 disordered gamblers to one of three conditions: a wait-list control, a workbook containing cognitive-behavioral exercises alone, or the same workbook with 20-45 minutes of motivational phone intervention. Gamblers in the MET plus workbook condition reduced gambling more than those in the wait-list condition in the short-term, but those in the wait-list condition were then provided therapy so long-term efficacy was not established. Gamblers in the MET plus workbook condition decreased gambling more than those in the workbook alone condition for 6 months, and benefits were maintained for those with less severe baseline gambling during a one-year follow-up.

We have recently completed a study (Petry, Weinstock, Ledgerwood, & Morasco, 2008) in which 180 disordered gamblers who were not specifically seeking treatment for gambling were randomized to a no treatment control condition, 10 minutes of brief advice about gambling that incorporated personal feedback and some motivational techniques along with concrete steps for reducing gambling, one 50-minute session of MET, or one session of MET plus three additional sessions of CBT. Within the 6 weeks of study enrollment, those in the brief advice condition significantly decreased gambling relative to the control condition. Over the remaining 9 months, no further changes in gambling were noted, and patients continued gambling at significantly lower rates than pre-treatment. Patients receiving MET alone evidenced no significant differences from the control condition. Those in the MET plus CBT condition did not reduce gambling more so than those in the control condition during the first 6 weeks of

treatment, but benefits of this intervention were apparent on some outcome measures throughout the 9-month follow-up period.

These results demonstrate efficacy of brief interventions and MET when combined with CBT for reducing gambling. Due to their brief duration and non-confrontational approach, such interventions may be suitable for substance abusers or those with other psychiatric or medical conditions who are identified as having a gambling problem during the course of treatment for another disorder.

V. Summary and conclusions

In summary, problem and pathological gambling affect a clinically significant proportion of the general population, and disordered gambling can occur at substantially higher rates in some specific subgroups, such as substance abusers and patients with some psychiatric and medical disorders. Thus, screening for disordered gambling in these high-risk groups is advised. While some individuals with problem and pathological gambling will recover on their own, treatment options for gambling disorders exist. Patients uncovered with problem gambling should be referred for gambling treatment, which can involve brief, motivational, and cognitive-behavioral interventions.

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