

Assessing and Treating Problem Gambling: Empirical Status and Promising Trends

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Objective: Ways to clinically assess and treat problem gambling evolve as our knowledge about this disorder increases. This paper summarizes current knowledge about treating problem gambling and describes developments in the assessment, psychology, and biology of problem gambling that may be important for treatment.

Methods: We reviewed recent published literature reporting advances in the assessment, psychology, and biology of problem gambling. We retained for review only controlled clinical trials in which subjects were randomized to either psychological or pharmacologic treatment.

Results: Although several gambling treatments were found to be efficacious, support for any specific treatment modality is still limited. Cognitive-behavioural treatments were most effective. Although diagnostic assessment has improved, there are still very few measures of gambling-related variables. The contribution to gambling of sex, concurrent psychiatric disorders, cognitive distortions, and impulsivity has been described. Evidence implicating decision-making areas of the cortex and disturbances in serotonin and dopamine functioning has been reviewed. Available evidence for a genetic contribution to problem gambling is weak.

Conclusions: Improvements in the methodology of gambling-treatment research were discussed to advance the clinical approach to this disorder. Developments in the area of assessment, psychology, and biology of gambling should inform clinical approaches to a greater degree than they currently do. We identified the need to study different types of gambling separately, rather than combining them, as an important goal.

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Highlights

- Evidence that problem gambling can be effectively treated is becoming increasingly available.
- Several suggestions for improving research on problem gambling treatment are provided.
- Accumulating knowledge about the assessment, psychology, and biology of gambling suggests that treatments, both psychological and pharmacologic, should reflect differences among individual problem gamblers.

Key Words: *problem gambling, gambling treatment, assessment, psychopharmacology*

This article briefly describes the major pharmacologic and psychological treatment modalities for problem gambling and establishes their relative efficacy. We emphasize controlled research for gambling treatment, consistent with the American Psychological Association recommendations regarding empirically validated treatments (EVT; 1,2). These criteria define the conditions that should be met when

deciding whether a treatment has been empirically validated. They require that interventions be tested in randomized clinical trials and shown efficacious in at least 2 studies by 2 independent research teams. We refer readers to Walker (3), Lopez-Viets and Miller (4), and Blaszczynski and Silove (5) for excellent reviews of the gambling-treatment literature in

general and to Toneatto and Ladouceur (6) for a recent critical review of the controlled-treatment literature.

Prior to reviewing the treatment literature, however, this article summarizes both recent advances in the assessment of problem gambling and developments in the psychological and biological understanding of problem gambling. Finally, we suggest guidelines for future gambling-treatment research.

Recent Developments in the Assessment of Problem Gambling

The increasing development of assessment instruments specific to gambling pathology aids accurate identification of disordered gambling. Available tools focus primarily on diagnostic factors (that is, the degree of involvement and consequences associated with gaming behaviour) with the goal of classifying gamblers along a continuum of severity or assessment tools that tap gambling-related attitudes and beliefs. We offer a brief overview of several currently available assessment instruments chosen for their psychometric properties.

Diagnostic Tools

Currently, there exists no well-established structured clinical interview for assessing problem gambling. However, the Diagnostic Interview for Gambling Severity (7) and the Pathological Gambling Module of the Diagnostic Interview Schedule are currently in the pilot stages, and preliminary indices of reliability and validity are encouraging (8). Complementing more structured clinical interviews, Hodgins and Makarchuk found that gamblers' self-reported frequency of gaming and amounts wagered yielded an acceptable level of reliability and validity (9).

The South Oaks Gambling Screen (SOGS; 10) is arguably the best-known self-report screening tool for gambling pathology. The SOGS was developed in the mid-1980s for use with clinical populations; it has subsequently been used worldwide. According to Stinchfield, use of the SOGS in the past 10 years has extended to nonclinical populations and prevalence surveys, which raises questions about its psychometric properties and classification accuracy under these conditions (11). Further, development of the SOGS items was based on DSM-III and DSM-III-R criteria, and item content does not well reflect current changes to the now-updated DSM-IV criteria (8).

The Canadian Problem Gambling Index (CPGI) attempts to address concerns about the SOGS and to develop a more appropriate measure of problem gambling for use in the general population by offering a more "holistic view of gambling" within a social context (12). The CPGI has 3 main sections: gambling involvement, problem gambling assessment, and correlates of problem gambling (including familial history of gambling). It yields 5 categories of gambling

behaviour, ranging from nongambling to problem gambling. Initial studies indicate that the CPGI demonstrates good reliability and validity.

The DSM-IV diagnostic criteria for pathological gambling have recently been put into practice in a 10-item self-report measure (13). In 2000, Fisher constructed the DSM-IV-Multiple Response (DSM-IV-MR) following successful use of this format in a youth population (14). Although a cut-off score of 5 is traditionally required to meet the DSM criteria, Fisher adopted a continuum approach and classified respondents who scored 3 or 4 as "problem gamblers." Those who endorsed 5 or more items were classified as "severe problem gamblers." For clinicians and researchers interested in a very brief self-report instrument using DSM-IV criteria, Johnson and colleagues have constructed the Lie/Bet questionnaire (15,16). This questionnaire contains only 2 items: "Have you ever felt the need to bet more and more money?" and "Have you ever had to lie to people important to you about how much you gambled?" Two separate investigations indicate that the measure has good predictive validity and is appropriate for use with both clinical and community populations.

Attitude and Belief Measures

Recent research into cognitive factors associated with problem gambling has led to the emergence of several brief self-report measures investigating gambling-related cognitions and perceived efficacy. These measures aim to assess motivations for gambling and assist in treatment planning and outcome measurement. Kassinove's Gambling Attitudes Scale (GAS) is designed to uncover attitudes that may underscore the development of disordered gambling (17). Initial findings showed that the scale had adequate internal consistency and construct validity when tested on a group of college students. Breen and Zuckerman developed the similar Gambling Attitudes and Belief Survey (GABS), which targets cognitive biases, irrational beliefs, and positive values regarding gambling (18). More recently, Steenbergh and colleagues developed the Gambler's Belief Questionnaire (GBQ), a 21-item measure of gamblers' cognitive distortions, specifically in regard to luck-perseverance and illusions of control (19). Psychometric properties of the GBQ indicate adequate internal consistency, reliable performance over time, and the ability to distinguish between problem and nonproblem gamblers. Measurement of cognitive distortions is becoming more specific to gaming activity, as evidenced by the Informational Biases Scale (IBS; 20), which was designed specifically for use with video lottery terminal users. May and others developed the Gambling Self-Efficacy Questionnaire (GESQ), a 16-item measure designed to assess perceived self-efficacy in controlling gambling behaviour (21). The GESQ is conceptualized as useful in planning treatment and evaluating intervention efficacy. Finally, Millar developed the Gambling

Metacognition Questionnaire (GMCQ), a 12-item measure designed to assess metacognitive processes related to problem gambling, specifically, a gambler's reflective concern about participation in gaming, preoccupation with winning, and issues related to affect regulation (22). Preliminary findings indicate that the measure displays adequate reliability and content validity and that GMCQ scores are related to gambling severity.

Recent Developments in the Psychological Understanding of Problem Gambling

Recent efforts to increase our understanding of the psychology of problem gambling have focused on several areas, including the role of negative affect (that is, depression and anxiety), personality factors (such as sensation seeking, impulsivity, boredom proneness, extroversion, locus of control, narcissism, and antisociality), concurrent disorders (that is, the overlap between gambling pathology and mood disorders, substance misuse, and attention-deficit hyperactivity disorder [ADHD]), sex differences, and the role of cognitions (including metacognition). This section highlights some of the relevant research; readers interested in a thorough review of the literature are referred to Raylu and Oei (23).

The Role of Negative Affect

Depression. The association of pathological gambling with a dysphoric or depressive mood state is one of the most researched predispositions to pathological gambling. Investigations in this area have produced mixed results, with some research initiatives unable to establish a connection between depression and gambling (24). Conversely, several studies have highlighted the cooccurrence of gambling and depressive symptoms (for example, 25,26). According to Grant and Kim, 29% of participants had a concurrent diagnosis of major depressive disorder (27). This result is consistent with the high concordance of depression among pathological gamblers reported in the clinical literature (28). Research in this area would be advanced by attempts to address the temporal onset of depression in pathological gamblers, that is, to determine whether mood symptoms precede or mediate the gambling pathology.

Anxiety and (or) Obsessive–Compulsiveness. Similarities between problem gambling and obsessive–compulsive disorders have been noted, specifically, preoccupation with gambling and the enormous amount of time spent developing gambling strategies and planning gaming behaviour (29). Blaszczynski found that pathological gamblers scored significantly higher on measures of obsessive–compulsiveness than did research control subjects, especially with regard to excessive preoccupation with intrusive gambling-related thoughts (30). Frost and others examined obsessive–compulsive factors in lottery and scratch-ticket gamblers (31). Results of

this study confirmed Blaszczynski's findings that pathological gamblers endorse more symptoms of obsessive–compulsiveness when compared with recreational gamblers (30).

Personality Factors

Sensation Seeking. A relation between gambling behaviour and the individual's desire for an aroused state has received equivocal empirical support. One explanation offered for the inconsistent results is that sensation seeking differs across gambling activities. Because gambling is not a homogeneous activity, sensation seeking may be more prominent in some types of gambling activities than in others (32). In addition, sensation seeking may be a state rather than a trait, peaking at certain times when gambling is particularly satisfying or arousing for the individual (32).

Impulsivity. The hypothesis of an association between impulsivity and disordered gambling follows naturally from the inclusion of pathological gambling in the impulse disorders section of the DSM-IV. Some research has demonstrated that pathological gamblers score higher on indices of impulsivity, compared with research control subjects (33,34). Petry has suggested that impulsivity could be conceptualized and measured as a multidimensional construct that includes such behaviours as orientation to the present, diminished ability to delay gratification, behavioural disinhibition, risk taking, sensation seeking, boredom proneness, reward sensitivity, hedonism, and poor planning abilities (35).

Concurrent Disorders. Significant research identifies comorbidity between gambling pathology and mental health problems, especially substance use disorders, mood disorders, ADHD, and personality disorders. Specker and others compared pathological gamblers in treatment with control subjects from the community (36). Findings revealed that 54% of pathological gamblers had an Axis I disorder (most frequently, affective, substance abuse, and anxiety disorders). Further, 25% of subjects displayed Axis II personality disorders (most frequently, avoidant personality disorder). Additionally, Petry found that subjects who abused substances and had a gambling problem reported increased levels of somatization, obsessive–compulsiveness, interpersonal sensitivity, and paranoia (37). A more recent study by Ladd and Petry found that gamblers with a history of treatment for substance abuse reported more depression, hallucinations, suicidal ideation and attempts, and difficulty controlling violent behaviour over their lifetime, compared with gamblers who had not been previously treated for substance abuse (38).

Sex Differences. A small body of work examines sex differences in motivations for gambling. According to a study by Grant and Kim, women are more triggered to gamble by feelings of loneliness and dysphoria, compared with men (39).

Further, women's motivations for gambling include escape from personal or family problems, whereas men gamble more for excitement and to win money (23). A more recent study by Scannell and others confirmed that women employ more emotion-focused coping strategies, such as avoidance and self-blame, which in turn lead to reduced control over gambling behaviour (40).

Cognitive Variables

In the gambling literature, a substantial body of work has been devoted to investigating cognitive factors within pathological gambling (for example, 3,29,41–43). There is little question that problem gamblers exhibit unique cognitive psychopathology that distinguishes them from social gamblers (44); however, there is less consensus as to whether such cognitions are causally related to the onset and maintenance of problem gambling. Although treatments targeted at correcting cognitive distortions are effective (for example, 45,46), it is too early to tell whether treating cognitive distortions is a prerequisite for successful gambling-treatment outcomes. Research investigating the cognitive pathology specific to different types of gambling is beginning (for example, see 47 for research related to slot machines and 48 for research related to lottery players), but much more is necessary before the cognitive characteristics of different types of gambling are understood, together with their role in the course of problem gambling.

Recent Developments in the Biological Understanding of Problem Gambling

Only within the past decade has investigation begun into biological factors associated with the development and maintenance of problem gambling. Although this research is in its infancy, several significant and encouraging findings have emerged with respect to genetic factors, brain activity or functioning, and neurotransmitter performance.

Genetic Factors

Biobehavioural studies focused on the potential genetic transmission related to problem gambling behaviour have produced mixed results. One of the earliest studies, by Comings and others, found that pathological gamblers were more likely than control subjects to carry a particular genetic variant of the dopamine D₂ receptor that has been associated with chemical dependency (49). Additional research by Eisen and others, which investigated 3359 male monozygotic (MZ) and dizygotic (DZ) twin pairs, found that familial factors accounted for 56% of 3 or more self-reported symptoms of pathological gambling and 62% of the diagnosis of pathological gambling (50). Conversely, Winters and Rich found mixed evidence for the heritability of problem gambling behaviour among female MZ and DZ pairs (51). Moreover,

this study found that in male MZ and DZ pairs only “high action” gambling involvement (that is, gambling in casinos and playing slot machines) supported a genetic role in pathological gambling. Further support for these findings can be found in the only metaanalysis published on the role of genetics in problem gambling (52). This research investigated 17 studies and found an overall weak familial effect for problem gambling. Walters noted that genetic transmission could be more reliably inferred for “high severity” male problem gamblers. Much additional investigation is needed to better understand the role of familial factors and potential sex differences in the genetics of gambling pathology (53).

Brain Activity or Functioning

Biological advances in pathological gambling have extended to the examination of the various brain regions. Potenza and others recruited 10 adult men who met criteria for pathological gambling, together with 11 male control subjects, to view videotaped scenarios that included a gambling-specific scenario (54). According to functional magnetic resonance imaging, subjects suffering from pathological gambling who viewed a videotaped gambling scenario showed decreased activity in the frontal and orbitofrontal cortex, the caudate-basal ganglia, and the thalamus. An additional study of men suffering from pathological gambling found differences in the activity level of the left ventromedial prefrontal cortex and its orbitofrontal components following performance on the Stroop task (55). The authors argued that the ventromedial prefrontal cortex has been implicated in decision making, and the orbitofrontal component in the processing of rewards, during the expectancy and experiencing of monetary gains or losses. Finally, Regard and colleagues found that gamblers who were not substance dependent had a history of brain damage (that is, traumatic head injury or pre- or perinatal complications); impaired concentration, memory, and executive functions; higher prevalence of left-handedness; and dysfunctional EEG activity (particularly in the frontotemporal-lymbic regions) (56). As with the genetics of pathological gambling, much additional research is needed to identify structural abnormalities and differences in brain activity, as well as potential sex differences, in those who suffer from disordered gambling.

Neurotransmitter Performance

The literature exploring the role of neurotransmitter dysfunction in pathological gambling has identified serotonergic, norepinephrine, and dopaminergic abnormalities. Serotonin disturbance has been linked to the expression of various impulse disorders. For example, Carrasco and others found low levels of monoamine oxidase (MAO) activity in subjects suffering from pathological gambling, compared with control subjects (57). MAO activity is noted to be a peripheral index

of serotonergic function (58). This result was confirmed by Blanco and others, who also found low levels of MAO platelet activity in male pathological gamblers, compared with control subjects (59).

Research into the role of dopamine dysfunction in pathological gambling has found, at least in men, reduced cerebrospinal fluid levels of dopamine and increased metabolites, compared with control subjects (60). A more recent study investigated sensory motor gating as a measure of endogenous brain dopamine activity in subjects suffering from pathological gambling (61). This study found increased dopaminergic transmission in pathological gambling. The researchers caution, however, that their findings only support indirect evidence of dopamine dysfunction and that more research is needed to confirm the finding. Additional support for neurotransmitter dysfunction exists in the literature reviewing the efficacy of pharmacologic agents in the treatment of pathological gambling. Grant and others comprehensively discuss pharmacologic treatments for disordered gambling (62), and Raylu and Oei offer a more detailed review of neurotransmitter dysfunction in gambling pathology (23).

Recent Developments in the Treatment of Problem Gambling

Psychological Treatments

The psychological treatments that have been evaluated in controlled trials can generally be classified as brief and cognitive-behavioural in orientation. The focus has generally been on modifying gambling-related behaviours and cognitions and on developing behavioural and cognitive coping skills to reduce gambling frequency, gambling expenditures, or gambling urges. Below, we briefly review several controlled studies.

Behaviourally Oriented Treatment Studies. McConaghy and colleagues have conducted several controlled studies of imaginal desensitization and compared it with various alternative treatments (for example, electric aversion therapy and imaginal relaxation) (63,64). Key findings showed that imaginal desensitization is more effective than electric aversion therapy, but not superior to imaginal relaxation, in attaining abstinence or a marked reduction of gambling and gambling-related urges.

Cognitive-Behaviourally Oriented Treatment Studies. Echeburua and others found that subjects exposed to 3 active treatments (specifically, exposure and response prevention, group cognitive restructuring, and combined treatment) achieved higher rates of abstinence at 6 months posttreatment, compared with a waiting list control group (65). The individually administered response-prevention treatment was found to be superior to the group or combined treatment at 1-year

follow-up, with no group differences between the active treatments for any of the other dependent variables (for example, frequency of gambling).

In a more recent study, Echeburua and others treated subjects who gambled on slot machines with stimulus control and in vivo exposure followed by response prevention until they were abstinent (66). Subjects were subsequently randomly assigned to 1 of 3 relapse-prevention (RP) modalities: individual RP, group RP, and no RP control. Significant differences in abstinence rates between the 2 RP groups and the no-treatment control group emerged at 3 months post-treatment and were maintained throughout the 12 month follow-up.

Milton and others enhanced a cognitive-behavioural intervention with interventions designed to increase treatment compliance (67). Subjects who received the compliance enhancements (for example, follow-up letters, positive reinforcement, and increased self-efficacy) completed the 8-session program at a higher rate (65%), compared with those randomly assigned to the standard cognitive-behavioural therapy (CBT) (35%). However, there were no group differences on measures of improvement (for example, the SOGS or measures of percentage of net monthly income gambled away in the past month). Similarly, no group differences on a measure of clinically significant change were evident at 9-month follow-up.

Cognitively Oriented Treatment Studies. Sylvain and others found gamblers treated with cognitively oriented therapy to be superior to a waiting list control group on measures of gambling behaviour (for example, frequency and hours spent gambling) and on measures of clinically significant change (68). Cognitively treated subjects maintained gains up to 12 months posttreatment.

Ladouceur and others found that subjects given individual cognitive therapy at posttest were superior to the waiting list control group on measures of diagnostic symptoms, desire to gamble, perceived self-efficacy, and gambling frequency (46). On measures of clinically significant change, virtually all the treated sample and none of the waiting list control group improved (a finding similar to that of Sylvain and others' study, reviewed earlier; 68). At 1-year follow-up, significant differences between pretest and follow-up were found for the key dependent variables.

Recently, Ladouceur and others evaluated group cognitive treatment in a randomized controlled trial with a waiting list control group (45). Results at posttreatment were very similar to those found earlier by these researchers, with almost 9/10 cognitively treated gamblers no longer classifiable as pathological gamblers, compared with 2/10 gamblers in the control group (68). Gains were maintained at 2-year follow-up.

Self-Help Approaches. Dickerson and others evaluated a minimal intervention for gamblers by comparing a self-help manual mailed to subjects with the manual plus telephone and postal contact only (69). The manual-only group reduced their weekly gambling sessions and weekly dollars wagered for the 6 months following the manual's mailing, whereas the manual-plus-interview group showed this reduction for only 3 months postinterview.

Hodgins and others compared a waiting list control group with groups receiving 2 versions of a cognitive-behaviourally based self-help manual (that is, they either simply mailed the self-help manual or preceded the mailing with a telephone motivational interview reviewing the assessment information and enhancing commitment to change) (70). They randomly assigned 102 subjects to 3 groups with follow-up of up to 12 months. Significant reduction in gambling behaviour was reported by 84% of subjects over the 1-year follow-up period. At the early follow-ups, an initial superior outcome was demonstrated by the group receiving motivational intervention plus the manual, compared with the manual-only group (for example, 42% vs 19%, respectively, at 3 months); this was not evident at 12 months, except for gamblers with less severe problems.

Pharmacologic Treatments. Recent years have witnessed proliferating research evaluating the efficacy of a wide variety of medications used to treat problem gambling, although to date no medication has been approved for treatment of this disorder. Grant and others have recently reviewed the evidence of pharmacotherapy for problem gambling and summarized the key issues in this area of research (71). Below, we summarize the few studies that have employed double-blind, placebo-controlled, and randomization methodology.

Hollander and others conducted a double-blind crossover trial of fluvoxamine in which 13 gamblers were randomly assigned either to receive fluvoxamine for 8 weeks, followed by placebo for 8 weeks, or to receive the reverse order (72). Ten subjects completed at least 12 weeks of treatment. Clinician ratings of improvement showed that both groups improved within 1 or 2 weeks of medication and remained relatively stable thereafter throughout treatment. Blanco and others also evaluated fluvoxamine treatment in a 6-month, double-blind, placebo-controlled study (73). They found no group differences on measures of reduced gambling expenditures and time spent gambling, although evidence for the superiority of fluvoxamine was found in younger gamblers and in male gamblers.

Kim and others evaluated naltrexone in a 12-week, double-blind, placebo-controlled randomized study (74). Eligible subjects were first enrolled for a 1-week period in a single-blind placebo lead-in. The naltrexone group reported higher

rates of much or very much improvement (75% of sample), compared with 24% of the placebo group, who improved much or very much.

Kim and others evaluated paroxetine treatment in an 8-session, double-blind, randomized clinical trial (75). Paroxetine was found to be more effective at the end of treatment, as evaluated by rating scales. There were no significant group differences at the end of treatment in a second study of paroxetine's efficacy (a 16-week, double-blind, placebo-controlled study), according to investigator ratings of clinical improvement and other measures (71).

In a 14-week, single-blind trial evaluating lithium and valproate, 42 subjects who gambled received either medication (76). On self- and investigator ratings of improvement, both medications performed equally well, compared with baseline; however, they did not show any group differences at the end of treatment.

Based on the best-conducted research to date, there is no compelling empirical evidence for the efficacy of any medication except for naltrexone (75). However, this finding has yet to be replicated in a double-blind, placebo-controlled study, suggesting that this medication can only be considered possibly efficacious. In many studies, improvement rates appear to favour the medication, but statistical significance is often not attained. Thus, although there is reason for optimism that effective pharmacotherapy for problem gambling will be developed, much additional research is needed.

Summary of Treatment Efficacy

Review of the best-designed treatment studies indicates that cognitive-behavioural and pharmacologic treatments for gambling are possibly efficacious; in no case has any specific modality been found effective by at least 2 independent research teams. In much of the psychological therapy research, significant findings have been found for CBTs, compared with waiting list control; significant findings have been found less often when CBTs are compared with other viable treatments. The studies by Echeburua and others (65,66), Ladouceur and others (45,46,68), and Hodgins and others (70) appear to be the best-conducted studies to date and suggest that interventions falling within the cognitive-behavioural spectrum, even when delivered via a manual and involving only minimal therapist contact, have the most empirical support, compared with no treatment. Among the medications that have been studied, some limited support for naltrexone seems to be promising. However, it is not possible to determine which specific type of CBT or medication is most effective or whether it is more effective than other approaches to treatment.

Implications for Treatment Delivery

With the prevalence of concurrent addiction and psychopathology among gamblers established (for example, 77), appropriate screening for such comorbidity and determination of the primary disorder should assist decisions about treatment (which will most likely be a combination of psychological and pharmacologic therapies). To address the function of gambling properly, treatment for gamblers who suffer from concurrent disorders should take into account the functional relation between gambling and other psychiatric and addiction symptoms. Very little research has investigated the outcomes that followed combination of validated psychological therapies and medications.

For gamblers who do not possess a comorbid disorder, the initial intervention should strive to increase the individual's commitment to treatment and resolve treatment-disrupting ambivalence as much as possible. The relatively high rate of dropout and treatment noncompletion suggests that more effort should be made to strengthen the client's motivation to change. Interventions consistent with the stage of change model would be appropriate.

The available empirical research suggests that CBTs, generally brief and delivered on an outpatient basis, are the most effective treatments to date, because they have strengthened motivation. Concurrent pharmacotherapy (that is, with naltrexone and selective serotonin reuptake inhibitors [SSRIs]) is a promising adjunct at the present time.

Future Directions

Although all the reviewed treatment studies met the basic criteria of randomization to a control group, all suffered from methodological limitations. To improve future treatment research, sample sizes need to be larger to increase the chance of detecting significant differences. This is particularly important for medication research, where sample sizes have been very small (62). Continued attention should be paid to developing validated measures of gambling behaviour and related constructs (for example, urges and cognitions). Gambling-treatment research has long been plagued by poorly constructed and insufficiently validated assessment scales. Many studies—especially the medication-research studies—have also relied on clinician ratings and measures of gambling-related constructs and have tended to neglect direct measures of gambling behaviour. Perhaps owing to its relative novelty, the gambling-treatment literature has tended to combine diverse types of gambling behaviours and avoided the specifying treatments for different gambling subtypes. Combining different gambling subtypes in a single treatment study may introduce a source of variance that interacts with the delivered treatment (whether psychological or pharmacotherapeutic). Researchers are encouraged to define their

gambling samples better to reduce such heterogeneity. Attention to the role of process (and not just outcomes) in treatment studies is important, since this will allow us to understand the effects of treatment across seemingly different treatment types. For example, if different treatments all show that increased coping with urges is a key correlate of outcome, specific treatments for urges can be developed. In the area of medication research, validation of the pathway by which medications produce their effects is also important. It is assumed that SSRIs modify gambling behaviour through their action on the serotonergic system; however, this has to be validated. The presence of comorbid psychiatric disorders and their implication for treatment have been generally neglected. Most studies do not appear to screen for psychiatric symptoms, much less to factor comorbid psychiatric symptoms into treatment plans. Since comorbidity seems to be prevalent (for example, 35,36,77) future research should develop treatments that take concurrent disorders into account. Finally, more attention should be paid to establishing both better baseline and longer-term follow-up (this is especially true of medication research) and better characterization of gambling behaviour along such key variables as frequency and gambling-related expenditures.

Daughters and others reviewed the available treatment literature and suggested that gambling-treatment outcomes can be improved by addressing the factors contributing to treatment failure (78). These researchers identify several predictors of poor treatment outcome and suggest that clinical research focused on them may influence the success of gambling treatment. These predictors include gambling-related cognitive distortions and beliefs about randomness, impulsivity or sensation seeking, biological vulnerabilities, and negative affect or mood symptoms. The conclusions of Daughters and others are consistent with the direction that future gambling-treatment research should take to improve the clinical outcomes achieved thus far (78).

Conceptually, the pathways model of problem gambling (79) synthesizes the role of the multiple determinants of problem gambling identified above and may be a useful guide to treatment. The pathways model identifies 3 main subgroups of problem gamblers: those whose gambling is controlled by conditioning, cognitive variables, and poor judgement (behaviourally conditioned problem gamblers); those who also suffer from premorbid psychiatric pathology, usually depression and anxiety, and who exhibit generally poor coping skills and disturbed personal histories (emotionally vulnerable problem gamblers); and those who demonstrate features of impulsivity and character disorders (especially antisocial personality disorder and other neurologic or biochemical disturbances (antisocial impulsivist problem gamblers).

Although the pathways model cannot be further elaborated in this article, it may be a useful approach to matching treatment to gamblers' clinical needs, assuming that the pathway subtype has been correctly assessed. The pathways model integrates the accumulating literature on the biology and psychology of gambling supported by advances in assessment and diagnosis; it can be considered a conceptual framework within which to development and understand the most effective treatments for problem gambling.

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Résumé : Évaluer et traiter les problèmes de jeu : l'état empirique et les tendances prometteuses

Objectif : Les façons d'évaluer et de traiter les problèmes de jeu évoluent à mesure que s'accroissent nos connaissances en ce domaine. Cet article résume les connaissances actuelles sur le traitement du jeu pathologique et décrit les développements de l'évaluation, de la psychologie et de la biologie du jeu pathologique qui peuvent être importants pour le traitement.

Méthodes : Nous avons examiné les progrès récents présentés dans la documentation publiée en ce qui concerne l'évaluation, la psychologie et la biologie du jeu pathologique. Nous n'avons retenu pour l'examen que les essais cliniques contrôlés dans lesquels les sujets étaient affectés au hasard soit à un traitement psychologique, soit à un traitement pharmacologique.

Résultats : Bien que plusieurs traitements du jeu se soient révélés efficaces, le soutien d'un mode de traitement spécifique quelconque est encore limité. Les traitements cognitivo-comportementaux étaient les plus efficaces. Même si l'évaluation diagnostique s'est améliorée, il y a encore très peu de mesures des variables liées au jeu. La contribution au jeu pathologique du sexe, des troubles psychiatriques cooccurrents, des distorsions cognitives et de l'impulsivité a été décrite. Des données probantes mettant en cause des zones décisionnelles du cortex et des perturbations du fonctionnement de la sérotonine et de la dopamine ont été étudiées. Les preuves disponibles de l'apport génétique au jeu pathologique sont faibles.

Conclusions : Nous avons présenté les améliorations de la méthodologie de la recherche sur le traitement du jeu pathologique pour faire progresser l'approche clinique de ce trouble. Les développements de l'évaluation, de la psychologie et de la biologie du jeu pathologique devraient éclairer les approches cliniques davantage qu'ils ne le font à l'heure actuelle. Nous avons discerné le besoin d'étudier différents types de jeu pathologique séparément plutôt que combinés comme étant un but important.