Effects of Medication and Cognitive Behaviour Therapy, Alone and In Combination, On Pathological Gambling

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Disclaimer: Opinions expressed in this final report are those of the investigator(s), and do not necessarily represent the views of the Ontario Problem Gambling Research Centre (OPGRC).
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Executive Summary

Background
Pathological gambling (PG), officially recognized by the American Psychiatric Association (APA) in the Diagnostic and Statistical Manual of Mental Disorders - third edition (DSM-III; 1980), is becoming a very significant social problem. This is due, in part, to the increasing prevalence of legalized gambling in many countries. There are several strategies used in the treatment of PG, including psychotherapy, and more recently, psychopharmacological agents. Unfortunately, most published studies of treatment outcome are either case histories with small numbers or are poorly controlled. One intervention with promise is a modified form of cognitive behaviour therapy (CBT) that focuses on the erroneous beliefs held by pathological gamblers (PGs), such as a misunderstanding of the concept of randomness and the illusion of control. Another novel treatment approach is the use of psychotropic medication, principally the serotonergic agents, which have been shown to be efficacious in subgroups of patients with impulse-control disorders and disorders residing within the obsessive-compulsive spectrum of disorders (OCSDs).

In the treatment of particular psychiatric disorders (e.g., obsessive-compulsive disorder [OCD] and depression) it has been shown that strategies combining psychotherapy (e.g., CBT) with psychopharmacology are more effective than either treatment alone. Given that both CBT and the use of selective serotonin reuptake inhibitors (SSRIs) have independently been shown to be effective in treating PG, the present study will look at the effects of these treatments alone and in combination in reducing gambling behaviours, as well as in changing motivational, attitudinal, and cognitive indices associated with the disorder.

Method
The original protocol incorporated five treatment groups: (1) Medication alone; (2) CBT alone; (3) Medication plus CBT; (4) CBT plus placebo; and (5) No treatment. Due to problems with recruitment, the investigators modified the study, with the permission of the Ontario Problem Gambling Research Centre (OPGRC), and reduced the number of treatment arms from five to three. The rationale was that paroxetine had recently been shown to be efficacious in the treatment of PG in a double-blind study (Kim, Grant, Adson, Shin, & Zaninelli, 2002), and the “No treatment” group was not essential.

Thirty-four PG participants (15 females and 19 males) were randomly assigned to one of three treatment groups: (1) Medication (paroxetine [Paxil®]) alone (n = 12); (2) CBT plus medication (Paxil®; n = 10); or (3) CBT plus placebo (n = 12). Participants were treated for 16 weeks and CBT was presented in an individualized format, initially weekly over 8 weeks, and then biweekly for the remaining 8 weeks. Participants were reassessed at 3 and 6 months post-treatment. Administered ratings included measures assessing changes in gambling behaviour over time. The scales used to assess PG behaviour in this study included:
- the PG modification of the Yale-Brown Obsessive-Compulsive Scale (PG-YBOCS); and
- the clinician-rated and self-rated versions of the Clinical Global Impressions (CGI), which evaluates urges to gamble (Gambling Symptom Assessment Scale [G-SAS]), as well as cognitive changes in erroneous perceptions about randomness and control (perception of control, desire to gamble, and self-efficacy perception).

Results
Over the course of the study, 7 participants in the Medication (Paxil®) alone group, 3 participants in the CBT plus medication paroxetine (Paxil®) group, and 5 participants in the CBT plus placebo group dropped out of the study. Importantly, the PG-YBOCS and G-SAS scores at Screening
(i.e., baseline scores) for participants who dropped out of the study did not differ from those of the participants who continued, \( F(1, 32) = 1.84, p = .18 \) and \( F < 1 \), respectively.

Both Paxil® and CBT were effective in reducing PG in all treatment groups; that is, gambling-related symptoms generally declined over the course of the study irrespective of treatment modality, based on all dependent measures.

While symptom levels declined among all groups, individuals who received treatment with both CBT and Paxil® demonstrated the most rapid decrease in gambling-related symptoms when compared to those who received only Paxil® or CBT and a placebo, as measured by the self-rating G-SAS. Also, there was a trend for individuals receiving CBT plus Paxil® to show greater improvements on self-efficacy measures of perceived control, desire to gamble, and perception of self-efficacy. Finally, participants in the combined treatment group saw greater improvements in their PG symptoms compared to those in the drug-only group after 16 weeks of treatment, as shown on the patient-rated CGI.

The small number of participants who returned for the 3- and 6-Month follow-up ratings precluded formulating any conclusions or even speculations about the durability of the treatment effects.

The limitations of this study included a small sample size due to recruitment problems and the lack of a pure placebo group.

**Conclusion**

In this study, the three treatment modalities (Paxil® alone, CBT plus Paxil®, and CBT plus placebo) were all shown to reduce symptoms of PG. On two measures, the combined approach of CBT plus Paxil® appeared to be more effective than either treatment alone. The small sample size, however, makes our results putative. It is recommended that future research combine treatment approaches (psychological and biological) using an adequate sample size and a pure placebo group.
Abstract

Two approaches that have shown some promise in the treatment of pathological gambling (PG) are cognitive behaviour therapy (CBT) and pharmacological treatment with selective serotonin reuptake inhibitors (SSRIs). In this study, we investigated the effects of an SSRI (paroxetine; Paxil®) and CBT, both alone and in combination, on PG. Participants (n = 34) fulfilled Diagnostic and Statistical Manual of Mental Disorders – fourth edition (DSM-IV; APA, 1994) criteria for PG, had a minimum score of 5 on the South Oaks Gambling Screen (SOGS), and were free of any other Axis-I comorbid disorder. They were randomly assigned to one of three treatment groups: (1) Medication (Paxil®) alone (administered 10-40 mg/day); (2) CBT plus medication (Paxil®); or (3) CBT plus placebo. Experienced therapists, trained in the methods of Ladouceur, Sylvain, Boutin, and Doucet (2002), delivered the CBT. Psychiatrists experienced in clinical research trials administered ratings and medication adjustments. Participants were treated for a total of 16 weeks. Changes in PG behaviour were measured by the Yale Brown Obsessive Compulsive Scale, modified for PG (PG-YBOCS), the Clinical Global Impressions Scale (CGI) modified for PG (Clinician- and patient-rated), the Gambling Symptom Assessment Scale (G-SAS), and cognitive measures looking at perception of control, desire to gamble, and self-efficacy perception. Nineteen participants completed the study to 16 weeks. Overall, participants improved on all measures regardless of treatment type. However, only on the G-SAS and the patient-rated CGI were the responses qualified by the type of treatment received. Individuals who received treatment with both CBT and Paxil® demonstrated the most rapid decrease in gambling-related symptoms compared to those receiving Paxil® alone or CBT plus placebo. In addition, the CBT plus Paxil® group showed a significantly lower patient-rated CGI score at 16 weeks compared to the Paxil® alone group. There was a trend for the combined treatment group to show greater improvement on the self-rating domains of perception of control over gambling, desire to gamble, and perception of self-efficacy. The small sample size may have precluded finding significant differences between the treatment groups.
Introduction

Background

Pathological gambling (PG) was first recognized as a significant psychiatric disorder in the 1980 edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychological Association [APA], 1980). Currently, PG is classified in the fourth edition of the DSM (DSM-IV; APA, 1994) as an Impulse-Control Disorder Not Elsewhere Classified, along with other disorders such as pyromania, trichotillomania, etc. According to the DSM-IV, “The essential feature of Pathological Gambling is persistent and recurrent maladaptive gambling behaviour (Criterion A) that disrupts personal, family or vocational pursuits” (APA, 1994, p. 615).

Hollander and Rosen (2000), in a review, present the case for obsessive-compulsive spectrum disorders (OCSDs), which link several disorders together based on shared features, including profile of symptoms, neurobiology, etiology, and response to treatment. They see the spectrum as having two poles -- Compulsive and Impulsive -- with various disorders occupying points on the spectrum. They envisage PG as occupying a location on the Impulsive side, not too distant from the centre of the spectrum. Pathological gambling has also been conceptualized as a type of addictive disorder (DeCaria & Hollander, 1993). A recent paper by Blanco, Moreyra, Nunes, Saiz-Ruiz, and Ibanez (2001) has more closely examined the conceptualization of PG with regards to whether it should reside with the addictions (in this case, it would be a non-pharmacological addiction) or OCSDs. They concluded that PG shares more characteristics with the addictions, but also suggest that it may be a heterogeneous disorder with some subtypes resembling obsessive-compulsive disorder (OCD) and others lying in the realm of addictions.

There is some evidence that there are neurobiological correlates to PG. For example, noradrenergic (NA) dysfunction, as evidenced by cerebral spinal fluid (CSF) plasma 3-methoxy-4-hydroxyphenylglycol (MHPG), a measure of central NA function, is increased in pathological gamblers (PGs) compared to normal controls (Roy, Custer, Lorencz, & Linnoila, 1988). Gamblers have also been shown to have lower monoamine oxidase (MAO) activity compared to normal controls (Blanco et al., 2001), which is also seen in individuals who are impulsive (Perris, Jacobsson, von Knorring, Oreland, Perris, & Ross, 1980) and risk-taking (von Knorring, Oreland, & Winblad, 1984). Indirect evidence for a role for serotonin lies with studies that have shown that selective serotonin reuptake inhibitors (SSRIs), such as clomipramine and fluvoxamine, reduce gambling behaviours and urges to gamble (Hollander et al., 1998; Hollander, Frenkel, DeCaria, Trungold, & Stein, 1992). Hollander and Rosen (2000), in their recent review of PG, suggest that several neurotransmitter systems may play a role in the pathophysiology of this disorder. Furthermore, there may be differential roles for the transmitters with serotonin dysregulation mediating initiation and disinhibition, noradrenaline modulating arousal and risk taking, and dopamine playing a role in reward mechanisms.

A few studies have looked at the effects of psychotropic medications on PG. Early research used medications to treat a primary disorder with gambling as a secondary diagnosis. Examples of this have been the use of lithium to treat bipolar disorder with gambling compulsions (Moskowitz, 1980) and clomipramine to treat patients with PG and associated obsessive-compulsive features (Hollander et al., 1992). More recently, some attempt has been made to treat compulsive gambling behaviour with medication when it is the primary diagnosis. As mentioned above, Hollander and his associates believe that a subgroup of PGs belongs in the OCSDs. They suggest that serotonergic dysfunction may underlie the etiology of PG and thus, SSRIs such as fluvoxamine might be efficacious. In one single-blind study, a significant reduction in gambling behaviour with fluvoxamine in an 8-week active phase study was shown (Hollander et al., 1998). More recently, in a randomized, double-blind cross-over design, Hollander, DeCaria, Findell, Begaz, Wong, and Cartwright (2000) showed that fluvoxamine may be effective in the treatment of PG, although it was noted that there were some problematic issues in the results primarily centering around order effects and small sample sizes. Most recently, there have been
some research endeavors that target the opioid system. Kim, Grant, Adson, and Shin (2001) were able to show positive effects of naltrexone, an opioid antagonist, on gambling symptoms in a double-blind, placebo-controlled trial. In designing this study, the authors reasoned that since naltrexone has been shown to be efficacious in the treatment of several disorders where urges are the dominant symptom (i.e., alcoholism, bulimia nervosa, drug abuse, etc.), it might be an effective treatment in PG. Toneatto, Brands, Selby, and Sinclair (2001) hypothesize that the release of endogenous opioids may be involved in the reinforcement mechanism in alcohol consumption and perhaps in excessive gambling. They are currently investigating the effectiveness of naltrexone in comorbid alcohol dependence and PG.

Although several strategies based on cognitive models have been proposed in the treatment of compulsive gambling, a more promising one is based on the premise that gamblers have an erroneous perception of randomness. Furthermore, there is an illusion of control whereby gamblers believe that they can develop strategies to win. They also incorporate superstitious behaviours, which they believe increase their chances to win (Ladouceur & Walker, 1996). Based on these premises, Ladouceur has designed a cognitive-behavioural treatment (CBT) package for PG. Furthermore, the efficacy of this approach has been examined in a controlled study with results pointing to clinically significant changes in outcome, such as motivational/attitudinal and clinical indices. More specifically, 86% of patients receiving CBT no longer met DSM-III criteria for PG, and had a greater perception of control over their disorder and increased self-efficacy in gambling situations. In addition, and more importantly, the treatment gains were maintained at the 6 and 12 month follow-ups. It is noteworthy that this highly effective approach was carried out with patients on an individual basis.

**Study Rationale**

With the advent of legalized gambling, as well as changes in technology (e.g., electronic machines and Internet gambling, etc.), one could assume that gambling behaviour is on the rise, given the increasing accessibility of gambling opportunities. Shaffer and Hall (1996) have estimated that 1% of the adult population and 3% of the adolescent population have ongoing gambling problems. More importantly, these same authors have shown in a meta-analytic review that the prevalence of adult gambling has increased from 1977 to 1997. Finally, several studies have shown that gambling behaviour is a significant social problem that correlates with substance abuse, depression, suicide, antisocial behaviour, family problems, etc. (e.g., Vitaro, Ferland, Jacques, & Ladouceur, 1998).

A variety of treatment approaches have been tried with PGs. These approaches have included psychoanalytically-focused therapies, behavioural, cognitive, and group therapies, self-help groups (primarily Gamblers Anonymous), and medications. The data on these different forms of therapy will not be reviewed here except to mention that the better controlled studies have used CBT methods, including imaginal desensitization (Blaszczynski, McConaghy, & Frankova, 1991), cognitive restructuring (Sylvain, Ladouceur, & Boisvert, 1997), and exposure and response prevention (Echebura, Baez, & Fernandez-Montalvo, 1996). In general, the very few controlled studies using CBT have been found to be effective in the treatment of PG.

In addition to psychological or psychosocial therapies in the treatment of PG, a relatively new approach lies in the area of psychopharmacology. Although PG is officially (i.e., DSM-IV) classified as an impulse control disorder, it is also seen by others as part of the OCSDs, and many of these disorders respond to medications (i.e., SSRIs). At the same time, there has been a small body of research that has found neurobiological correlates in PGs (well reviewed in Hollander, Buchalter, & DeCaria, 2000). Finally, several studies (e.g., Hollander et al., 2000) have shown some effects of SSRIs on the reduction of gambling urges and behaviours.

Intuitively, the combined approach to treating a particular disorder (i.e., empirically-based psychotherapy plus medication) should be superior to either treatment alone in treatment-responsive disorders. However, the research literature has not always supported this. For example, studies on the effectiveness of CBT with and without psychotropic medication have produced contradictory findings.
in the treatment of depression. For OCD, there are several studies that have found contradictory results
with regards to the superiority of combination treatment (summarized in van Balkom and Anton, 1998).
O’Connor, Todorov, Robillard, Borgeat, and Brantt (1999) take the view that the combination of CBT
and medication potentiates treatment efficacy in OCD. There are currently no documented studies
examining the combined effect of CBT and medication on PG. There is a need to sharpen the
treatments of this disorder, and it may very well be that combined treatment may be effective for at
least a subgroup of PGs. Furthermore, as with the observation made by many clinicians who treat
OCD, medication may serve to potentiate the efficacy of CBT.

As mentioned previously, there has been a paucity of studies that have investigated the effects
of psychotropics on reducing gambling behaviour. More importantly, a review of the literature failed to
identify any studies which have looked at combining psychotherapeutic and pharmacological
approaches, a strategy that has been used in both the depression and OCD literature. Finally, there are
currently no well-defined predictors for CBT or medication outcomes in PG. A combined approach
may increase the likelihood of increasing the number of PGs who benefit from treatment, as there may
be patients who do not respond to either treatment alone but may benefit from a combined approach.
Positive results in this study would contribute to more effective treatment strategies for PG. Finally, it
may be possible, based on the results of the present study, to begin exploring indices (e.g., strength and
number of cognitive distortions) that predict treatment outcome. This would lead to future research
endeavors to hone treatment strategies for this disorder.

Although PG is a well recognized disorder, to the best of our knowledge, there are no research
initiatives on this disorder in Eastern Ontario. We hope that our project would be the beginning of
research endeavors in this area, and we therefore expect to eventually link up with consumer groups. At
present, our group is involved in developing functional magnetic resonance imaging (MRI) and has
linked up with a group of professionals from different disciplines for this investigation.

**Purpose, Goals, and Research Questions**

The goals of the present study are as follows:

1. To investigate the efficacy of a specific manualized treatment package for PG. As noted
   above, this cognitive behavioural package focuses on educating the patient on erroneous
   assumptions about randomness and the illusion of control. In the proposed study, the
treatment package will focus on an individualized format. Three- and 6-month follow-up
   periods (post-study) will examine whether responders to the initial treatment continue to
   maintain treatment gains.

2. To examine the effects of an SSRI medication in the treatment of PG. Paroxetine (Paxil®) is
   the drug of choice in this study based on its very high usage in psychiatric practice and its
   level of tolerability. Paroxetine is the most prescribed SSRI in Canada, and has
demonstrated efficacy in OCD and OCSDs (Ravindran, Lapierre, & Anisman, 1999). A 3-
   and 6-month follow-up period will examine whether responders continue to maintain gains
   while on the medication.

3. To determine whether the combined effects of the CBT treatment package and medication
   are superior to either treatment alone. Three- and 6-month follow-up will be examined to
determine whether combinatorial effects, if seen at the end of the initial trial, are
maintained.
Method

Data Collection and Sampling

Participants

Participants were recruited from a variety of sources, including advertisements placed in local papers, from Addictions Assessment Services of Ottawa-Carleton, and the Ontario Problem Gambling Helpline. Potential participants were carefully screened and included only those over 18 years of age who met DSM-IV criteria for PG (APA, 1994), had a score of at least 5 on the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987), and were not currently receiving psychotherapy directed at PG. Furthermore, participants were excluded if they met criteria for any comorbid Axis I or Axis II disorder, and had a known sensitivity to SSRIs or non-response to previous SSRI treatment.

All participants signed an informed consent after the study requirements and possible side effects of the study medication were explained. Participants were also told that they could choose to withdraw their consent at a later date.

Design

Outline of Study Procedures

The original protocol incorporated five treatment groups: (1) Medication alone; (2) CBT alone; (3) Medication plus CBT; (4) CBT plus pill placebo; and (5) No treatment. Due to problems with recruitment, the investigators modified the study, with the permission of the Ontario Problem Gambling Research Centre (OPGRC), and reduced the number of treatment arms from five to three (refer to Appendix A for recruitment procedures). The rationale was that paroxetine had been recently shown to be efficacious in the treatment of PG in a double-blind study (Kim, Grant, Adson, Shin, & Zaninelli, 2002), and the no treatment group was not essential.

This was a 16 week placebo-controlled, double-blind, flexible-dose, parallel-group design clinical study. Participants were randomized to one of the following three treatment groups: (1) Medication alone (MED); (2) CBT plus placebo (CBT+PLA); and (3) CBT plus medication (CBT+MED). Randomization took place at Screening without a lead-in period. All participants were to have a minimum of eight visits to be evaluable. All participants were asked for permission to be contacted for follow-up visits by the study psychiatrist at 3 and 6 months post-study.

Participants who were randomized to receive individual CBT were scheduled to have 12 individual therapy sessions during the 16-week study; weekly from Weeks 1 to 8 and bi-weekly from Weeks 8 to 16.

Active Treatment Phase

At Screening, a research psychiatrist conducted a thorough medical history in order to screen participants for any medical conditions that may render them ineligible for the study. After screening procedures were completed and informed consent was signed, eligible participants were randomly assigned to one of the three treatment groups (MED, n = 12; CBT+PLA, n = 10; CBT+MED, n = 12). All clinician-administered ratings were done by a psychiatrist well-trained in the treatment of OCD and OCSDs.

The medication used in this study was Paxil® in the recommended dose range (20-60 mg) with matching placebo. The dosing of medications was at the discretion of the treating psychiatrist. Medication titration was individualized and based on clinical response and tolerability. Paxil® was started at 10 mg per day for the first week, and increased by 10 mg in the following week and every 2 weeks thereafter until the optimum dose (maximum of 60 mg) was reached (titration details outlined in Table 1). Depending on clinical response and tolerability, the psychiatrist had the flexibility to lower the dosage. Participants had to be able to tolerate a minimum dosage of 20 mg to remain in the study.
The psychiatrist did not discuss any information about controlling gambling behaviour with these participants.

**Table 1:** Administration schedule for Paxil®

<table>
<thead>
<tr>
<th>Time</th>
<th>Dose</th>
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<tbody>
<tr>
<td>Screening visit</td>
<td>10 mg</td>
</tr>
<tr>
<td>Week 1</td>
<td>10 or 20 mg</td>
</tr>
<tr>
<td>Weeks 2-4</td>
<td>20 or 30 mg</td>
</tr>
<tr>
<td>Weeks 4-8</td>
<td>20, 30, or 40 mg</td>
</tr>
<tr>
<td>Weeks 8-12</td>
<td>20, 30, 40, 50, or 60 mg</td>
</tr>
<tr>
<td>Weeks 12*-16</td>
<td>20, 30, 40, 50, or 60 mg</td>
</tr>
<tr>
<td>Weeks 16-18</td>
<td>Down-titration period</td>
</tr>
</tbody>
</table>

* Patients did not receive any dose increases following Week 12.

Participants who were randomized to the MED group were treated and assessed under double-blind conditions, and the clinicians administering the CBT did not participate in the ratings. Participants were treated over a 16-week period with medication and were seen by the study psychiatrist at Screening, Weeks 1, 2, 4, 8, 12, and 16, with a follow-up visit at Week 18.

Participants in the CBT+MED and CBT+PLA groups were seen by the psychiatrist at similar times as the MED group participants. Participants who withdrew prematurely from the study continued to receive ongoing follow-up with the research study psychiatrist as appropriate and as agreed to by the psychiatrist and the patient. A down titration period was sometimes recommended by the study psychiatrist for participants who withdrew early if the participant had been titrated to a higher dose level.

Following the 16-week active treatment phase, all participants engaged in a down-titration phase where medication was gradually withdrawn over a 2-week period. Post-study follow-up included medication treatment, if indicated, based on clinical judgment and individual preference of the patient.

All participants assigned to the CBT+MED and CBT+PLA groups entered a 12-session, 60 minute individual cognitive therapy over a 16-week period, with sessions initially held weekly for the first 8 weeks, and then bi-weekly for the remaining 8 weeks. Therapy sessions followed the approach of Sylvain et al., (1997), with emphasis on the following four components:

a. cognitive correction about gambling (concept of randomness, erroneous beliefs held by gamblers, awareness of inaccurate perceptions about gambling, and cognitive corrections of erroneous perceptions);

b. problem-solving training;

c. social skills training; and

d. relapse prevention.

Therapists used a manualized approach based on the text “Understanding and Treating the Pathological Gambler” by Ladouceur, Sylvain, Boutin, and Doucet, 2002.

At the end of the CBT component, all participants receiving study medication followed the same procedures as the MED group. Therapists well-experienced in CBT methods for mood and anxiety disorders including OCD and OCSDs delivered the CBT.
Post-Study Phase
Participants on Paxil® who withdrew prematurely from the study continued to receive ongoing follow-up with the research study psychiatrist as appropriate, and as agreed to by the psychiatrist and the patient. This treatment may have included another medication (e.g., another SSRI such as fluvoxamine, which has been shown to be helpful in PG) or psychotherapy such as CBT.

Following the 16-week active treatment phase, all participants randomized to either Paxil® or placebo participated in a down-titration phase where medication was gradually withdrawn over a 2-week period. At Week 18, a post-study follow-up visit took place to monitor adverse events. Participants were offered medication treatment, if indicated, based on clinical judgment and individual preference of the patient.

Safety Assessments
For all study participants, blood pressure, heart rate, and weight were recorded at Screening, Weeks 1, 2, and 4, and then every 4 weeks until Week 16.

Data Collection Tools
Clinician Administered Scales
The PG modification of the Yale-Brown Obsessive-Compulsive Scale (PG-YBOCS; Hollander et al., 1998) is a modification of the widely used scale for overall improvement of OCD. This rating scale has been modified to measure severity of gambling behaviour and change in gambling symptoms after treatment. It is from unpublished work by DeCaria et al. (as cited in DeCaria & Hollander, 1993) who reported high inter-rater reliability and satisfactory convergent validity with the SOGS. The PG-YBOCS was administered at Screening, Weeks 8 and 16, and 3- and 6-Months follow-up.

The Hamilton Depression Rating Scale (HAM-D; Hamilton, 1960) is a clinician-administered screening instrument designed to measure the severity of illness in adults diagnosed with depression. The HAM-D is widely used for measuring outcome in mood disorders and has demonstrated high validity and reliability in measuring responses to treatment. HAM-D was administered at Screening, Weeks 8 and 16, and 3- and 6-Months follow-up.

The Clinical Global Impressions (CGI; Guy, 1976) was originally developed for outcome studies in schizophrenia. It has been adapted for gambling research (Hollander et al., 1998) and measures the severity of PG as well as improvement. Although there is no information on the validity or reliability of this measure, it was used in the current study because several previous studies used it as an outcome measure (i.e., it was used here as an additional measure to ensure comparability of results across relevant studies). The CGI was administered in two forms: clinician-rated and self-rated.

Self-rating Scales
The Gambling Symptom Assessment Scale (G-SAS; Kim et al., 2001) was devised in a study on the effectiveness of naltrexone in PG. This instrument assesses gambling symptoms during treatment and includes past week gambling urges and thoughts, as well as amount of time spent in gambling activities. Good test-retest reliability and superior convergent validity was reported in its revised form. The G-SAS was administered at Screening, Week 16, and 3- and 6-Months follow-up.

On other self-rating scales, participants rated their cognitive changes in erroneous perceptions about randomness and control (Perception of Control, Desire to gamble, and Self-Efficacy Perception; Sylvain et al., 1997). These scales are focused on the didactic portion of Ladoucer’s CBT approach to treating PG, and were administered at Screening, Weeks 8 and 16, and 3- and 6- Months follow-up.
Data Analysis

Statistical Considerations

To assess whether the assumption of sphericity (the difference between the estimated means for any pair of groups is the same as for any other pair) had been met, Mauchley’s test of Sphericity (Mauchley’s W) was employed. Where this assumption was violated (as denoted by a significant Mauchley’s W), a Huynh-Feldt epsilon correction was applied to the degrees of freedom for both the effect and error term in each analysis with a within-subjects component. Trend analysis was employed to characterize main effects and interactions.

Mixed measures analysis of variance (ANOVA) methods were used to compare treatment groups at Screening, 8 Weeks, and 16 Weeks. Polynomial within-subjects contrasts were conducted for each measure at each of the three measurement intervals (at Screening [baseline], 8 Weeks, and 16 Weeks).

Results

The sample included 15 females (\(M_{\text{age}} = 50.40, SD = 9.61\)) and 19 males (\(M_{\text{age}} = 44.58, SD = 12.06\)), for a total of 34 participants. Over the course of the study, 7 participants in the MED group, 3 participants in the CBT+MED group, and 5 participants in the CBT+PLA group dropped out of the study. In none of the cases was this due to an adverse drug reaction. Table 2 shows the number of participants across the various phases of the study, including randomization at Screening, Weeks 8 and 16, and 3- and 6-Month follow-up.

Table 2. Flow of participants over the course of the study

<table>
<thead>
<tr>
<th>Descriptor</th>
<th>Number of Participants</th>
<th>As Percentage of Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Those Randomized at Screening</td>
<td>34</td>
<td>100%</td>
</tr>
<tr>
<td>Evaluable participants (those to complete at least 8 weeks in the study)</td>
<td>27</td>
<td>79.4%</td>
</tr>
<tr>
<td>Those to reach study end (16 weeks)</td>
<td>21</td>
<td>61.8%</td>
</tr>
<tr>
<td>Those to complete 3-month follow-up</td>
<td>11</td>
<td>32.4%</td>
</tr>
<tr>
<td>Those to Complete 6-month follow-up</td>
<td>8</td>
<td>23.5%</td>
</tr>
</tbody>
</table>

The number of participants in the three treatment arms at the Weeks 8 and 16 are shown in Table 3.

Table 3. Number of participants in each treatment arm at 8 and 16 weeks

<table>
<thead>
<tr>
<th>Group Assigned</th>
<th>Completed 8 Weeks</th>
<th>Completed 16 Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBT + Placebo</td>
<td>10 (8 + 2 CBT only)</td>
<td>9 (7 + 2 CBT only)</td>
</tr>
<tr>
<td>CBT + Paxil®</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Total CBT + Med</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>Med</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 4 describes the reasons for early termination of participants from the study. Importantly, at Screening, Y-BOC and G-SAS scores of those participants who dropped out of the study did not differ from those who continued, \(F(1, 32) = 1.84, p = .18\) and \(F < 1\), respectively.
Table 4. Participants who did not complete 18 weeks

<table>
<thead>
<tr>
<th>Participant #</th>
<th>Group</th>
<th>Visit Completed</th>
<th>Reason for Leaving Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>003</td>
<td>MED</td>
<td>week 8 visit</td>
<td>did not want to continue Paxil®</td>
</tr>
<tr>
<td>008</td>
<td>MED</td>
<td>screening</td>
<td>voiced concerned needed to quit Gamblers Anonymous (GA). Even with assurances could continue, Participant withdrew consent.</td>
</tr>
<tr>
<td>009</td>
<td>CBT + MED</td>
<td>week 2</td>
<td>did not keep CBT appointment; quit meds</td>
</tr>
<tr>
<td>012</td>
<td>MED</td>
<td>week 8</td>
<td>compliance issues at week 4; grief interfering with resolve to stay on study; refused follow-up visit</td>
</tr>
<tr>
<td>014</td>
<td>MED</td>
<td>week 4</td>
<td>experienced problems breathing at night so decided to quite meds. Refused follow-up visit</td>
</tr>
<tr>
<td>017</td>
<td>MED</td>
<td>screening</td>
<td>after taking meds claimed no desire to gamble again. Did not keep appointment. No to follow-up</td>
</tr>
<tr>
<td>019</td>
<td>CBT + MED</td>
<td>week 2</td>
<td>Start-up extended due to vacation. Claim drug interfered with sexual performance. Quite study. No to follow-up</td>
</tr>
<tr>
<td>020</td>
<td>CBT + MED</td>
<td>week 12</td>
<td>Participant felt “as if no medication”; missed CBT sessions. No show for follow-up appointment</td>
</tr>
<tr>
<td>021</td>
<td>MED</td>
<td>screening</td>
<td>withdrew consent as soon as was randomized to Paxil® only</td>
</tr>
<tr>
<td>023</td>
<td>MED</td>
<td>week 12</td>
<td>difficulty keeping appointments; compliance questionable; protracted time between visits due to dental surgery. Lost to follow-up</td>
</tr>
<tr>
<td>024</td>
<td>CBT + MED</td>
<td>week 1</td>
<td>received employment offer out of province -Alberta. Had to leave immediately.</td>
</tr>
<tr>
<td>025</td>
<td>MED</td>
<td>week 8</td>
<td>Distance to travel &amp; gas cost concern. New job and could not commit to remaining appointments.</td>
</tr>
<tr>
<td>029</td>
<td>CBT + MED</td>
<td>week 16</td>
<td>As soon as medication taper finished, no interest in keeping week 18 appointment. Tried 3 times</td>
</tr>
<tr>
<td>034</td>
<td>MED</td>
<td>week 8</td>
<td>Continued to gamble; study not helping; did not keep week 12 appointment. Refused follow-up.</td>
</tr>
</tbody>
</table>

A Kaplan-Meir Survival analysis showed that there was no difference between the groups at each time point with regards to participants dropping out of the study (log-rank statistic = .60, \( p = .74 \)).

Treatment Modality and Gambling-Related Symptomatology

**Y-BOCS**

It will be recalled that the Y-BOCS is a rating scale that has been modified to measure severity of gambling behaviour and change in gambling symptoms after treatment. As such, it was of interest to determine whether the improvement in gambling-related symptomatology varied in relation to the type of treatment received over time. To this end, a mixed measures ANOVA was employed with Y-BOCS
scores (at Screening, Week 8, and Week 16) as the within-subjects variables and treatment type (MED, CBT+MED, CBT+PLA) as a between-subjects factor. There were no significant interactions. A main effect of time, $F(2, 32) = 16.54, p < .001, \eta^2 = .51$ was evident; however, these responses were not moderated by the type of treatment received, $F < 1$. No between-groups effects were observed, $F < 1$.

To better characterize variation of gambling symptoms over the course of the study, polynomial within-subjects contrasts were conducted for gambling symptoms at each of the measurement intervals. As illustrated in Figure 1, these within-subjects contrasts indicated that over the course of the study, participants’ scores on the Y-BOCS were characterized by a significant downward linear, $F(1, 16) = 15.64, p < .001, \eta^2 = .49$, as well as a quadratic trend, $F(1, 16) = 24.22, p < .001, \eta^2 = .60$. This suggests that gambling-related symptoms had generally declined over the course of the study. The latter component was attributable to a decrease in the rate of improvement between Week 8 and 16 of treatment (refer to Figure 1).

**Figure 1.** PG-YBOCS scores at Screening, 8 Weeks, and 16 Weeks

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**Y-BOCS (Mean ± S.E)**

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**G-SAS**

As mentioned previously, the Y-BOCS provides a measure of severity of gambling behaviour and change in gambling symptoms after treatment. The G-SAS was developed to include past week gambling urges and thoughts, as well as amount of time spent in gambling activities. Thus, a second, similar analysis was undertaken; however, in this instance, G-SAS scores (at Screening, Week 8, and Week 16) were the within-subjects variables, and treatment type (MED, CBT+MED, CBT+PLA) was the between-subjects factor. As in the first analyses, the main effect of time, $F(2, 32) = 23.80, p < .001, \eta^2 = .60$ was significant; however, these responses were qualified by the type of treatment received, $F(4, 32) = 3.62, p < .05, \eta^2 = .60$.

In particular, polynomial within-subjects contrasts (see Figure 2) indicated that the interaction between G-SAS scores and type of treatment administered over the course of experimental sessions was characterized by a significant downward linear trend, $F(2, 16) = 5.13, p < .05, \eta^2 = .39$. As predicted, while symptom levels declined among all groups over the course of the investigation, individuals who received treatment with both CBT and Paxil® (CBT+MED) demonstrated the most rapid decrease in gambling-related symptoms when compared to those receiving only Paxil® (MED) or CBT and a placebo (CBT+PLA).
Clinical Global Impressions

Clinician-Rated CGI

A mixed measures ANOVA determined that a main effect of time $F(1, 16) = 15.26, p < .001, \eta^2 = .49$ was evident, and that these responses were not moderated by the type of treatment received, $F < 1$. No between-groups effects were observed, $F < 1$. Within-subject contrasts indicated that over the course of the study, participants’ scores on the CGI were characterized by a significant downward linear trend, $F(1, 16) = 15.26, p < .001, \eta^2 = .49$. This is shown in Figure 3.
**Self-Rated CGI**
A mixed measures ANOVA determined a main effect of time $F(1, 16) = 4.18, p = .05, \eta^2 = .21$. These responses were qualified by type of treatment received, $F(2, 16) = 3.96, p < .05, \eta^2 = .33$. However, no between-groups effects were observed, $F(2, 16) = 3.20, p = .07, \eta^2 = .29$. Subsequent pairwise comparisons, using a Bonferroni correction, indicated that the CBT+MED group showed a significantly lower CGI score at Week 16 when compared to the MED group, $p < .05$. This is shown in Figure 4.

**Figure 4.** Patient-rated CGI after 8 and 16 Weeks of treatment

![Patient-rated CGI](image.png)

**Patient-Rated Cognitive Measures**

**Perception of Control**
To assess whether participant-rated perceptions of control over the course of the investigation varied as a function of the type of treatment received, a mixed measures ANOVA was conducted with perceived control (at Screening, 8 Weeks, and 16 Weeks) as the within-subjects variable and treatment type (MED, CBT+MED, CBT+PLA) as the between-subjects variable. This analysis revealed that while there was a main effect of time, $F(2, 32) = 11.48, p = .001, \eta^2 = .42$, participants’ perceptions of control were not moderated by the type of treatment administered, $F(4, 32) = 1.62, p = .21, \eta^2 = .42$. As illustrated in Figure 5, a trend analysis indicated that participants’ perceived level of control over the course of the investigation was characterized by both a significant upward linear trend, $F(1, 16) = 12.00, p < .005, \eta^2 = .43$, and a quadratic trend, $F(1, 16) = 10.16, p < .005, \eta^2 = .39$. These results suggest that participants’ perceptions of control generally increased over the course of the investigation.
**Figure 5.** Perceptions of control scores at Screening, 8 Weeks, and 16 Weeks

![Perception of Control](image)

**Desire to Gamble**

To determine if participants’ desire to gamble varied with type of treatment received, a mixed measures ANOVA was conducted with participants’ desire to gamble (at Screening, 8 Weeks, and 16 Weeks) as the within-subjects variable and treatment type (MED, CBT+MED, CBT+PLA) as the between-subjects variable. As in the previous analysis, there was a main effect of time, $F(2, 32) = 12.47, p < .001, \eta^2 = .44$, that was not dependent on type of treatment administered, $F(4, 32) = 2.22, p = .09, \eta^2 = .22$. Polynomial contrasts indicated that participants’ desire to gamble over the course of the investigation was described by both significant downward linear, $F(1, 16) = 17.24, p < .001, \eta^2 = .52$, and quadratic trends, $F(1, 16) = 6.36, p < .05, \eta^2 = .28$. This suggests that participants had increasingly less desire to gamble over the course of the investigation (see Figure 6).

**Figure 6.** Desire to gamble scores at Screening, 8 Weeks, and 16 Weeks

![Desire to Gamble](image)
**Perceptions of Self-Efficacy**

In order to investigate whether participants’ perceptions of self-efficacy were altered in a manner related to the treatment administered, a mixed measures ANOVA was conducted with perceptions of self-efficacy (at Screening, 8 Weeks, and 16 Weeks) as the within-subjects variable and treatment type (MED, CBT+MED, CBT+PLA) as the between-subjects variable. Consistent with the previous analyses, a main effect of time was evident, $F(2, 32) = 3.28, p = .05, \eta^2 = .17$, and again, this was not qualified by the type of treatment received, $F < 1$. As outlined in Figure 7, subsequent trend analyses revealed that participants’ perceptions of self-efficacy increased in a linear manner over the course of the investigation, $F(1, 16) = 5.96, p < .05, \eta^2 = .27$.

**Figure 7.** Perceptions of self-efficacy scores at Screening, 8 Weeks, and 16 Weeks

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**Post Treatment Follow-up**

Participants who completed 16 weeks of treatment were asked to return for ratings by the psychiatrists. Unfortunately, the small number of participants who did return for the post-treatment follow-up at 3 and 6 months precluded formulating any conclusions about the durability of the treatment effects. The number of participants in each treatment group at both follow-up periods is shown in Table 5.

**Table 5.** Number of Participants in Each Treatment Group at Both Follow-up Periods

<table>
<thead>
<tr>
<th>Treatment</th>
<th>16 Weeks</th>
<th>3-Month Follow-up</th>
<th>6-Month Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>MED</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>CBT + MED</td>
<td>6</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>CBT + PLA</td>
<td>9</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Totals</td>
<td>19</td>
<td>11</td>
<td>8</td>
</tr>
</tbody>
</table>
Discussion

The purpose of this project was to examine the efficacy of two treatments for PG (an SSRI and CBT modified for CBT), both alone and in combination. This was a unique approach as this specific combined approach has not been demonstrated in the existing PG literature. The rationale for combining two different treatment modalities is based on findings that medication and CBT are more efficacious than single treatments in other psychiatric disorders, including mood and anxiety disorders.

Unfortunately, the low number of participants in this study had a significant effect on statistical power, and therefore the results may only be viewed as suggestive, at best. As described above, we found that all treatments were effective regardless of the measure used. Although the interactions between all dependent measures and treatment modalities did not reach statistical significance, it should be noted that as predicted, there was a trend for individuals who received CBT and Paxil® to show greater improvements on two outcome measures compared to participants who received Paxil® alone or CBT and a placebo. Indeed, as predicted, while symptom levels declined among all groups over the course of the investigation, individuals who received treatment with both CBT and Paxil® demonstrated the most rapid decrease in gambling-related symptoms when compared to those receiving only Paxil® or CBT and a placebo, as measured with the G-SAS. As previously described, the G-SAS is a self-rating scale developed to measure gambling “cravings”. Thus, it is noteworthy that the combination of both Paxil® and CBT produced the most rapid decrease in gambling-related symptoms, which are focused on cravings.

Another significant finding occurred on the self-rated CGI. Specifically, the CBT + Paxil® group had a significantly lower CGI score at 16 weeks compared to the Paxil® alone group (after pair wise comparisons using a Bonferroni correction). This measure looks at participants’ perceived improvement in gambling “condition”. This finding was not apparent on the clinician-rated administration of this measure. Thus, it appears that the participants had a different view of their overall improvement compared to the psychiatrists.

Our results are comparable to those of Grant et al. (2003) who recently examined the efficacy of paroxetine in the treatment of PG in a large sample of participants (n = 76). These investigators, in a multi-center trial (5 centers in the United States and Spain) using the CGI as the primary outcome measure, found that both paroxetine and placebo-treated groups demonstrated comparable improvement at 16 weeks. This held true for other measures assessed, including the PG-YBOCS and G-SAS.

Limitations

As mentioned above, the limitations of this study included a small sample size, due to recruitment problems. As noted at the beginning of this report, the original proposal called for five treatment arms. This was later changed to three arms due to a low recruitment of participants. One of the treatment arms eliminated was a pure placebo group. This decision was made as several studies had already shown that SSRIs are helpful in treating PG and thus utilizing a placebo group was not entirely necessary (see Appendix B). At the same time, given that these types of medications have been shown to be helpful, the ethics of withholding an active treatment was also considered. Nevertheless, the lack of a pure placebo group calls into the question of whether the changes in PG could have been due to a time effect and/or other non-specific factors (i.e., attention, enrollment in a PG treatment program, etc.).

There are few well-validated outcome measures that measure change in gambling behaviour across different types of treatment. Whatever validation that has occurred has been conducted with small sample sizes, and has not been done across different treatment modalities (i.e., medications, CBT, etc.).
Conclusions and Implications

In our study, both Paxil® and CBT were effective in reducing PG. Combining both treatments produced a superior effect when assessed with the G-SAS and the self-rated CGI. Furthermore, there was a trend for individuals receiving CBT plus Paxil® to show greater improvements on self-efficacy measures of perceived control, desire to gamble, and perception of self-efficacy. The study was limited due to a small sample size and the lack of a pure placebo group.

Future Research

As with other psychiatric disorders where a psychological treatment is combined with drug therapy, superior effects of combining approaches, compared to single treatments, have been found. It is recommended that future research be carried out across several research centers to help increase the number of participants and treatment arms. The use of multi-center designs is often employed in efficacy studies (i.e., drug studies and empirically supported psychotherapies, such as CBT) and has been used in the work of Grant et al. (2003) on paroxetine and PG (as described above). Future research would probably produce more definitive results if sample sizes were increased through the use of multi-centre designs.

It also appears that the use of medication or placebo, at least from the work by Grant et al. (2003), can induce significant improvements after 16 weeks of treatment. Although they did not carry out a post-study follow-up to see whether the improvements held, a study by Blanco, Petkova, Ibanez, and Saiz-Ruiz (2002) found that even after 6 months of treatment with fluoxetine, which was effective in PG, was not superior to the placebo (i.e., it was equally effective). Thus, future research should examine the non-specific factors inherent in the treatment of PG. As Grant et al. (2003) have well stated, participants entering a PG study may be more motivated to control gambling behaviours as they have passed the pre-contemplation and contemplation stages of change that are well described in Stages of Change research (Prochaska & Norcross, 2001).
References


Appendix A: Recruitment of Participants

The original project submitted to the OPGRC proposed a five arm study with 21 participants per treatment arm for a total of 105 participants (based on a power analysis and accounting for potential drop-outs). This was proposed as the effects of the active treatments would be better demonstrated if there were sufficient control groups.

By September 2003, the protocol was revised with the permission of the OPGRC, to research only three arms (rationale given previously in this report). In this revised protocol, the number of participants changed to 26 in each arm, for a total of 78 participants (based on a new power analysis including potential drop-outs). An extension of time and increased funding were received to continue the problem gambling study.

By February 2004, the second interim report was prepared and the strategies to date for recruiting were reviewed. Suggestions incorporating new approaches to increase recruitment were proposed. A further time extension was requested and granted from the OPGRC. It is noted that funds on hand were to be used for new initiatives with no further funding.

The investigators were also asked to report on their funding efforts and attempt to identify potential helpful approaches. Table 1 illustrates the type of advertising, time frame, and dollars spent on the main forms of appeals to the public.

Table 1. Type of advertising, time frame, and dollars spent on appeals to the public

<table>
<thead>
<tr>
<th>Type of Advertisement</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005 (recruitment ended 28Feb05)</th>
<th>Number attracted for screening</th>
<th>Number Entered into the study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad production Radio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Newspaper ads/Print ads</td>
<td>$3,129</td>
<td>$6,489</td>
<td>$6,485</td>
<td>$1,129</td>
<td>73</td>
<td>21</td>
</tr>
<tr>
<td>Posters (all locations)</td>
<td>$107</td>
<td>$2,874</td>
<td>$107</td>
<td></td>
<td>25</td>
<td>8</td>
</tr>
<tr>
<td>Bus ads (Tear-offs, cross city routes)</td>
<td>$6,825</td>
<td></td>
<td></td>
<td></td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Totals</td>
<td>$3,139</td>
<td>$16,873</td>
<td>$6,592</td>
<td>$1,129</td>
<td>118</td>
<td>30*</td>
</tr>
</tbody>
</table>

* Total 34 recruited—the 4 remaining participants were recruited through Physician/clinician/family referrals, where direct advertising costs cannot be ascribed.

In addition, and using the preprinted posters as enclosures, a letter campaign was developed to inform local health care professionals (mostly family physicians) that our study was available and to ask for their assistance. Following the mail-out, each addressee was contacted to ensure that the material had arrived and to offer answers should there be any questions or concerns. We attained very important information from this initiative:
• Many centers and clinics that treated PG were against having their clients referred to a research study, especially at a psychiatric hospital. They also did not wish to suspend their treatments for PG while these referrals would be in a research study.
• Most family physicians and centers do not read or respond to unsolicited printed material; it is either trashed or filtered by support staff.
• Many potential referrals had concurrent disorders (i.e., substance use) and therefore could not be enrolled in our study. This was a protocol design exclusion which could not be set aside (i.e., potential recruits could not have any other Axis I disorder).

We learned from this experience to use personal contacts before delivering posters and fliers. We also discerned that more awareness of PG was needed to help potential participants self-identify and self-refer. Posters, pamphlets and fliers were developed to raise awareness of problem gambling. These were delivered to pharmacies, community centres, universities, and health clinics (see Appendix D and Appendix F).

The next strategy was to use a “blitz” with local city-wide newspapers, community papers, an ethnic newspaper, magazines for seniors, and university and college papers. Special rates were negotiated with publications for repeat advertisements on a weekly or bi-weekly basis. Although there was an initial response to the blitz advertising, this was offset by publicity of the study medication, Paxil®, at the height of our print campaign (i.e., a series of articles on Paxil® and suicide in adolescents in the Ottawa Citizen, May 2004 see Appendix G). When potential screen participants heard that Paxil® was the study medication and that they would be randomly assigned, many did not wish to become part of this study.

Another putative effect from increased advertising was that potential participants thought there may be a payment to take part in the study. This question was most prevalent from Internet inquiries. When they were told that there would not be any financial payment, interest waned.

In February of 2004, our citywide newspaper, the Ottawa Citizen, published a five-part series on research and researchers (see Appendix G). The articles did not look favorably on medication-type research, which may have accounted for the severe drop in telephone inquiries and responses on our Internet site (i.e., there were no inquiries for 20 days –see Appendix B).

After 3 months of slow to no response to the ongoing advertisements, we felt another problem may be occurring; specifically, if the advertisements are there repeatedly, it appears that the study is going on indefinitely. This impression was aided by the fact that the initial newspaper articles about the study were published in 2002 (see Appendix C). For the public, this may encourage procrastinating, not dealing with a recognized problem. Our solution was to add a banner to the advertisements and posters acknowledging that this was a time limited study and that recruitment was ending by a specific date. This strategy effectively encouraged responses, and our last 5 participants were recruited after this addition. Table 2 shows the total number of responses and recruits for each advertising source.

<table>
<thead>
<tr>
<th>Name of Publication</th>
<th>Number of responses</th>
<th>Number of Recruits</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Ottawa Citizen (city wide)</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>The Ottawa Sun (city wide)</td>
<td>31</td>
<td>6</td>
</tr>
<tr>
<td>Nepean This Week (community paper)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Centre Town News (community paper)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Kitchissippi Times (community paper)</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2. Number of responses and recruits from each advertising source
<table>
<thead>
<tr>
<th>Name of Publication</th>
<th>Number of responses</th>
<th>Number of Recruits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hill Top Times (political paper)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>The Charlatan (Carleton University paper)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fulcrum (University of Ottawa paper)</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Algonquin Times (Algonquin college paper)</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>55 Plus (seniors biweekly paper)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Forever Young (Seniors monthly magazine)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Penny Saver (local weekly sales/events paper)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Personal ads in The Citizen</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Update (Human Resources monthly magazine)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TV Times (weekly magazine)</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Health Times (Chinese community paper)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Article in The Sun</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Article in The Citizen</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td><strong>Other Methods:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posters on OC Transpo Buses with Tear-offs</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Posters at The Slots- Rideau Carleton Raceway</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Posters in community centres/universities</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>Referrals by Physicians/Psychologist/family</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>134</strong></td>
<td><strong>34</strong></td>
</tr>
</tbody>
</table>

Total inquiries by phone and Internet was 217. Unfortunately, many (83) were either unreachable or would not return calls for telephone screening when messages were left. Many cell phones had no messaging or were disconnected.
### Appendix B: Tracking of Study Participants

<table>
<thead>
<tr>
<th>Week</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
<th>Group 5</th>
<th>Group 6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>3</td>
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<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note: Each group contains 3 participants.*
Appendix C: Articles from the Citizen about the Study in 2002
third getting both, a fourth given therapy and a placebo, and the final one subjected to a placebo only.

Funded by the Ontario Problem Gambling Research Centre, the nine-year study is expected to take about two years to yield data on 105 problem gamblers for a study believed to be a first in the world. The researchers will divide the gamblers into five groups to measure the effects of weekly cognitive behaviour therapy and/or antidepressant medication.

"Gamblers use what we call almost magical thinking, that they can figure out when they're going to win, they just feel it for it. They have a system, but none of that is correct. They're confusing chance with skill." These are the thoughts of Dr. Robert Ladouceur, one of Canada's foremost experts on gambling. The Quebec researcher reports that as many as 36 per cent of problem gamblers can be treated effectively with behaviour therapy.

The candidate selected for therapy will attend a weekly session of about 60 minutes for the first eight weeks, then biweekly sessions for another eight weeks. The therapy is an established way of acclimating the thinking process that leads the gambler to his delusional world. For the moment, the difficulty is trying to find recruits. While there are undoubtedly tens of thousands of problem gamblers in the area, the first round of recruiting has only attracted three candidates. "Part of the problem is denial," said Dr. Ladouceur. "They feel they're in control. They might say they enjoy it but they don't recognize the compulsive element." Add Dr. Telier, also a psychologist and a professor at the University of Ottawa: "They're thrill-seeking."

The next step is broader advertising and more appeals to groups already working with problem gamblers. Those taking part in the ROH study say nothing for the treatment. Connie Waddell, the research nurse manager, has taken calls from about 20 possible subjects. She was struck by the stories they told. Cleaning out the bank accounts of relatives spending every evening watching sports, better place bets the next day, the impacts on family life, the loss of old friends. "It creates enormous wrack and ruin in their lives."

Not all patients would be accepted to the study however, because subjects must not already be on any anti-depressant medication or be battling other addictions. Those interested in finding out if they qualify are asked to call 789-2094.

Gambling is a multi-billion-dollar industry in Ontario, with 14 government lottery games, five charity casinos, three large stand-alone slot machines at 23 racetracks. The Ontario gaming research centre was created by the Ministry of Health in April 2003 and funded by two per cent of the gross revenue from slot operations in Ontario's charity casinos and racetracks. The government funds treatment at 40 designated agencies across Ontario, prevention programs, and research like the ROH study.
**Time limited study   Note: enrolment ends January 2005**

**GAMBLING PROBLEM?**

Are you concerned about gambling too much (sports or track betting, lottery ticket purchases, VLT or slot machine use, etc.)?

The University of Ottawa Institute of Mental Health Research is looking for volunteers to take part in a medication and cognitive therapy research study.

There is no cost for study medication or therapy sessions. You may qualify for this study if you:

- are at least 18 years of age
- are not currently receiving antidepressant treatment
- have no other addictions (drug / alcohol)

For more information, contact

(613) 798-2994

or email: study@rohcg.on.ca

ALL INQUIRIES ARE CONFIDENTIAL.

University of Ottawa Institute of Mental Health Research
Appendix E: Problem Gambling Information Sheet for Health Professionals

Pathological gambling is a growing social problem due to the increasing prevalence of and access to legalized gambling. Pathological gambling can cause significant distress and hardship for some individuals. Unless asked, individuals suffering from this disorder may not fully disclose the extent of their problems, resulting in under diagnosis.

At the Institute of Mental Health Research, we are presently conducting a treatment-based study for this disorder. The research protocol is designed to compare different treatments and examine their effectiveness.

We are actively seeking participants for this study. If you are presently treating someone with pathological gambling or would like further information, please call 613-722-6521 ext. 6913.
Appendix F: Advertising Pamphlet

FACTS ON PROBLEM GAMBLING

- Of the approximately 19 million Canadians who gambled in 2002, approximately 5% developed moderate or severe gambling problems. Approximately 7% of 18-24 year olds exhibited moderate or severe gambling problems.

- Video lottery terminals (VLTs) were found to be the most addictive form of gambling with 25.6% of players falling into the at-risk or problem gambling categories.

- Of the 85% of problem gamblers who recognized they had a problem, over half said they were unsuccessful in their attempts to stop gambling.

- Problem gamblers have significantly higher rates of alcohol dependence, psychological distress, and financial problems in comparison to non-problem gamblers.

- Those significantly more likely to be at risk or have a gambling problem are
  - men (7.8%)
  - Aboriginal persons (18.5%)
  - those with less education (7.6%)
  - those who gamble weekly (14.3%) or daily (30.3%)

- Approximately one-fourth of problem gamblers report suffering major clinical depression at some point in their life; and one-fifth contemplated suicide during the previous year.

- Seniors on fixed income are particularly vulnerable to financial devastation.

SIGNS THAT A PERSON MAY HAVE A GAMBLING PROBLEM

- Gambling for longer and longer periods of time
- Constantly thinking about gambling
- “Chasing one’s losses”—gambling to win back losses
- Growing debt from gambling
- Neglecting family/personal needs (nutrition, sleep)
- Making an unusually high number of personal telephone calls
- Missing deadlines
- Often being absent from work/school
- Gambling to escape pressures or dysphoric mood
- Becoming involved in illegal activities to finance gambling
- Borrowing money frequently
- Lying about one’s whereabouts

Facts and figures provided by Statistics Canada and the Responsible Gambling Council.
Appendix G: Articles from The Citizen dated February and May 2004

**SPECIAL REPORT • DRUGS, MONEY AND ETHICS**

**The rush to recruit medical test subject**

New drugs must be tested on many people with a specific medical complaint. Finding them quickly has become an industry in itself, and these companies are willing to help you doctor or his files if he'll let them, says MARGARET MUNRO.

It is a bid to recruit patients for drug trials, private companies have been going through conditional medical records searching for people with specific medical conditions. Another approach is to advertise in newspapers, on television, and on the Internet. The methods are new and untested, and they raise questions about the ethics of using patients for medical research.

One of the companies, Qawal, has developed a system that allows researchers to search for potential patients based on their medical histories. The system is designed to help researchers find patients who are likely to respond to a particular treatment.

Another company, BioSource, has developed a similar system that allows researchers to search for patients based on their genetic profiles. The system is designed to help researchers find patients who are likely to respond to a particular drug.

However, there are concerns about the ethics of using patients for medical research. Some researchers are concerned that patients may be coerced into participating in trials, and that the results of the trials may not be accurate, because the patients are not representative of the general population.

In addition, there are concerns about the safety of using patients for medical research. Some researchers are concerned that patients may be harmed by participating in trials, and that the results of the trials may not be accurate, because the patients are not representative of the general population.

These concerns have led to calls for more regulation of medical research. Some researchers are calling for the government to require companies to obtain informed consent from patients before they can participate in trials, and to require companies to report the results of the trials to the public.

In the meantime, companies continue to recruit patients for medical research. The companies say that they are acting ethically, and that they are using the latest technology to recruit patients. The companies say that they are acting ethically, and that they are using the latest technology to recruit patients. The companies say that they are acting ethically, and that they are using the latest technology to recruit patients. The companies say that they are acting ethically, and that they are using the latest technology to recruit patients.
Bounty-Hunting doctors recruit human Guinea pigs

Special Report - Drugs, Money and Ethics
Drugs: Doctors, especially, get $1,000 to $5,000 per patient enrolled in a trial

THE SERIES: PHRASES, MONEY AND ETICS

Drugs: Doctors, especially, get $1,000 to $5,000 per patient enrolled in a trial.

THE SERIES: PHRASES, MONEY AND ETICS
Selling patients to the drugmakers

Doctors say accepting money from drug companies to sign up patients for clinical trials is a fair deal: the patient gets the potential benefits of a new treatment and the doctor is compensated for the time and effort needed to monitor the results. But who really profits? MARGARET MUNRO reports.

VANCOUVER

The research promoters are courting Dr. Rams Khanna ever since Whelan. The company is trying to recruit patients for a clinical trial sponsored by a pharmaceutical company that makes drugs. The others are taking to the streets, saying, "Vaccines are important, but they can't help you. The trials are not going to be open to the public unless they are interested."

Physicians say there are perks — a $2,000 gift card, a yearly expense for the first six months, and a yearly fee for the first three. But doctors insist they are not getting involved in clinical trials to get rich. They say they are getting more money because they can get more patients for less money. The company is paying the physicians to get more patients for the trial.

Dr. Rams Khanna, the chief of the department of medicine at the University of British Columbia, says the company is paying the doctors to get more patients for the trial. He says they are not getting involved in clinical trials to get rich. They say they are getting more money because they can get more patients for less money. The company is paying the physicians to get more patients for the trial.

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Vancouver's Dr. Rams Khanna says he is very selective when choosing which clinical trials to participate in. He says he only participates in trials that he believes are important and have the potential to benefit patients.

Another disturbing factor revealed in a health Canada audit of the drug trial alleged by a drug company involves the use of patients in an animal study. The inspectors uncovered deficiencies in almost all the trials, ranging from poor record-keeping to unethical treatment of patients.

In one instance, the inspectors found that a woman helping to run a trial had no training for the job. But that did not stop her from serving with interest, signing off on key study tasks. The most prevalent deficiency was with record-keeping and paperwork. A "vaccines headache," noted by a consultant, was transformed into a "moderate" headache on an adverse event report. Patient records and signed consent forms went missing and some forms failed to lay out the risks patients were taking by joining the experiment or dropping out.
Test Subjects Often Left in the Dark About Risks

Special Report: Drugs, Money and Ethics

Canada

Wednesday, September 6, 2006

The Ottawa Citizen

In this case, the test was for a new anti-sleeping pill. The patients were told they would be taking a pill that would help them stay awake during the day. However, no one told them the real purpose of the study was to determine the effects of the pill on their sleep patterns.
When no one watches the watchdogs

Federal standards could stop private boards from rubber-stamping applications, critics say

BY MARGARET MURDOCH

Canadian doctors in every province except Alberta are rubber-stamping unethical practices in their own province without any independent review. A recent study by the Canadian Medical Association found that 30% of Canadian doctors are rubber-stamping unethical practices without any independent review.

The study was conducted by a group of medical ethicists and researchers from the University of Toronto. They found that in 30% of cases, doctors were rubber-stamping unethical practices without any independent review. This is a significant problem, as it means that doctors are approving unethical practices without any independent review.

The study found that the rubber-stamping of unethical practices is often done by doctors who are not aware of the ethical implications of their actions. This is problematic, as it means that doctors are approving unethical practices without any independent review.

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The study calls for the implementation of federal standards that would require independent review of all applications for rubber-stamping unethical practices. This would help to ensure that doctors are not rubber-stamping unethical practices without any independent review.

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Health Canada orders antidepressant warning

Doctors advised to watch for suicidal or violent tendencies

BY SHARON KIRKBY

Canadian doctors will soon be warned to keep a sharp watch for suicidal thinking and impulses in children and adults taking the most widely prescribed class of antidepressants. Labelling changes are also expected to warn of severe behavioral changes such as hostility, aggression, self-harm and extreme agitation and restlessness may occur, in some cases within a few weeks of starting treatment or when doses have been increased or lowered.

The new warnings and precautions apply to drugs known as SSRIs, or selective serotonin reuptake inhibitors, a class that includes Prozac, Paxil and Zoloft, as well as serotonin norepinephrine re-uptake inhibitors (SNRIs), a newer generation of antidepressants that includes Effexor.

Drug companies are preparing to issue "Dear Health Professional" letters to doctors across the country outlining changes to their product monographs.

The labelling changes apply to a number of Peakrinan drugs, including Prozac (fluoxetine), Paxil (paroxetine), Zoloft (sertraline) and Effexor (venlafaxine).

According to IMS Health, which tracks prescription drug use in Canada, antidepressants are among the five classes of drugs recommended to patients aged 12 to 17. Last year, Canadians aged 19 and under made up about five per cent of the 9.3 million visits to doctors for depression. Seventy-five per cent of the visits by youth ended with a recommendation for an antidepressant.

But a major study published last month in the British Medical Journal concluded that no evidence exists to justify prescribing the drugs to children. Australian researchers who reviewed six published studies of Prozac, Paxil, Zoloft and Effexor said that the benefits had been exaggerated, the risks downplayed, and that children who took the drugs didn't do significantly better than those on a placebo, or fake pill.

Health Canada issued a public advisory in February about the increased risk of suicide in children taking SSRIs following two similar back-to-back advisories issued last year by the makers of Paxil and Effexor.

The revised product labels, which mirror those issued by the U.S. government, will go further and warn doctors of reports of severe agitation-like side effects in adults and children, as well as the risk of self-harm and harm to others. Doctors will be urged to carefully monitor patients for suicidal thinking.

"It is helpful to remind people that depression is a serious illness, a serious disorder that needs to be medically monitored," said Dr. Robert Milin, clinical director of the youth program at the Royal Ottawa Hospital.
SPECIAL REPORT: DRUGS, MONEY AND ETHICS

The nightmare of scientific deceit

Researchers at the University of Alberta thought they'd made a major discovery. Then they found a colleague had been lying, writes MARGARET MUNRO.

A scientific nightmare has been quietly unfolding at the University of Alberta, where a research technician deliberately falsified his own experiments and then tried to cover his tracks by altering his colleagues' work. U.S. authorities say the fraud was so clever that the team of researchers, including several graduate students and PhDs, thought they were on to a major discovery and published the falsified results in a leading scientific journal. They later learned their experiments had been sabotaged by one of their own.

"Technician Jianhua (James) Xu engaged in "significant" scientific misconduct, says a report by the U.S. Office of Research Integrity obtained by CanWest News Service. Mr. Xu was fired by the university for the misconduct, which destroyed years of research work and led to the retraction of a major research paper by the Edmonton research team.

Mr. Xu has also entered into a Voluntary Exclusion Agreement with U.S. authorities in which he agreed to forgo four years of appeal rights. He was banned from U.S. government contracts.

Canadian research authorities and the University of Alberta have said nothing publicly about the case. But U.S. officials, who have a formal process that names researchers undermining the integrity of science, say Mr. Xu "committed scientific misconduct by deliberately falsifying experiments" at the U of A. The tainted work was part of a project funded by the U.S. National Heart, Lung and Blood Institute, the Alberta Heritage Foundation for Medical Research, and the Medical Research Council, now known as Canadian Institutes of Health Research.

The falsification began in 1998, shortly after Mr. Xu began working for Professor David Bradley, an award-winning biochemist at the University of Alberta. Mr. Xu had arrived with glowing recommendations from Northwester University in Illinois, where he had completed a master's degree. He was soon an integral member of Mr. Bradley's team exploring the biochemical controls at work inside cells. The team hoped to find potent molecular tools that could halt or slow the growth of cancerous cells.

"According to the U.S. authorities, Mr. Xu decided to clandestinely add a little something extra to the experiments - a potent chemical inhibitor called vanadate," says a report by the U.S. authorities in which he agreed to forgo four years of appeal rights. He was banned from U.S. government contracts.

The other members of the research team, unaware of Mr. Xu's deceit, were excited when they saw its data. They wrote up the results of one set of the fraudulent experiments in a paper for publication, complete with graphs and tables, published in the Journal of Biological Chemistry in 2000. Ten of Mr. Xu's colleagues, including Mr. Bradley, put their names on the research report, with Mr. Xu as first author.

"I don't believe Mr. Xu's "discovery" was so important that it warranted such duplication," saysallenge fell on Mr. Xu while he was away on an extended vacation.

"The fraud was diffi

U.S. keeps watch on Canadian studies

American health authorities are more likely to blow the whistle on scientific and ethical misconduct involving Canadian researchers than government agencies in this country.

Last summer, U.S. authorities reprimanded the University of B.C. and its ethics boards for not clearly informing critically ill patients an experiment might hasten their death. Canadian authorities say they have "no records" of the problem.

Last April, the U.S. Food and Drug Administration issued a ban on a cancer drug trial by an Ottawa doctor for not ensuring the safety of a four-year-old boy who died after being given a massive overdose of the experimental cancer drug in the Ottawa component of the trial.

And now U.S. authorities have issued a report on a case of scientific misconduct at the University of Alberta in which a researcher falsified his experiments and those of his colleagues. Canadian authorities have said nothing.

Canada's lead medical research agency, the Canadian Institutes of Health Research, says it strives to "conduct research conducted "according to the highest ethical standards," which makes sense, the institute claims. Both agencies have a policy of dealing with problems of misconduct and breaches that come to their attention.

The Americans, who are more much more proactive about investigations, have the authority to investigate Canadian research, such as the Vancouver, Ottawa and Edmonton projects, that receipt funding from U.S. agencies.
### Appendix H: Study Measures

i) Problem Gambling-YBOCS

**PG-YBOCS**

For each item circle the number identifying the response which best characterizes the patient.

| 1. TIME OCCUPIED BY URGES/THOUGHTS ABOUT GAMBLING. | 0 = None  
How much of your time is occupied by urges/thoughts (u/t) related to gambling and/or gambling-related activities? How frequently does this occur? |
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>2 = Moderate (1-3 hrs/day), or frequent u/t (≥8 x/day, but most hrs/day are free of u/t).</td>
<td></td>
</tr>
<tr>
<td>3 = Severe (&gt;3 &amp; up to 8 hrs/day) or very frequent u/t (&gt;8 x/day &amp; occur most hrs of day).</td>
<td></td>
</tr>
<tr>
<td>4 = Extreme (&gt; 8 hrs/day), or near constant u/t (too numerous to count and an hour rarely passes w/o several such u/t occurring).</td>
<td></td>
</tr>
</tbody>
</table>

| 2. INTERFERENCE DUE TO U/T ABOUT GAMBLING. | 0 = None  
How much do your u/t interfere with your social or work (or role) functioning? Is there anything that you don’t do because of this? (If not currently working, determine how much performance would be affected if employed). |
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>2 = Moderate, definite interference with social or occupational performance, but manageable.</td>
<td></td>
</tr>
<tr>
<td>3 = Severe, causes substantial impairment in social or occupational performance.</td>
<td></td>
</tr>
<tr>
<td>4 = Extreme, incapacitating.</td>
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</tbody>
</table>

| 3. DISTRESS ASSOCIATED WITH U/T ABOUT GAMBLING. | 0 = None  
How much distress do your u/t about gambling cause you? (Rate “disturbing” feeling or anxiety that seems to be triggered by these thoughts, not generalized anxiety or anxiety associated w/ other symptoms). |
<table>
<thead>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 = Moderate, frequent, &amp; disturbing, but still manageable.</td>
<td></td>
</tr>
<tr>
<td>3 = Severe, very frequent, and very disturbing.</td>
<td></td>
</tr>
<tr>
<td>4 = Extreme, near constant, and disabling distress.</td>
<td></td>
</tr>
</tbody>
</table>
4. RESISTANCE AGAINST U/T OF GAMBLING.
How much of an effort do you make to resist these u/t? How often do you try to disregard them: (Only rate effort made to resist, not success of failure in actually controlling these thoughts. How much one resists the u/t may/may not correlate with ability to control them).

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Makes some effort to resist.</td>
</tr>
<tr>
<td>3</td>
<td>Yields to all such u/t without attempting to control them, but does so with some reluctance.</td>
</tr>
<tr>
<td>4</td>
<td>Completely and willingly yields to all such u/t.</td>
</tr>
</tbody>
</table>

5. DEGREE OR CONTROL OVER U/T ABOUT GAMBLING.
How much control do you have over u/t about gambling? How successful are you in stopping or diverting these u/t?

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Moderate control, sometimes able to stop/divert these u/t.</td>
</tr>
<tr>
<td>3</td>
<td>Little control, rarely successful in stopping these u/t, can only divert attention with difficulty.</td>
</tr>
<tr>
<td>4</td>
<td>No control, experienced as completely involuntary, rarely able to even momentarily divert u/t.</td>
</tr>
</tbody>
</table>

6. TIME SPENT IN ACTIVITIES RELATED TO GAMBLING.
How much time do you spend in activities related to gambling? (directly related to gambling itself or activities such as negotiating financial transactions or searching for financial resources related to gambling).

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None in these activities (≤ 8 x/day).</td>
</tr>
<tr>
<td>2</td>
<td>Moderate (1-3 hrs/day), or &gt; 8 x/day, but most hours are free of such activities.</td>
</tr>
<tr>
<td>3</td>
<td>Severe (&gt;3 &amp; up to 8 hrs/day) or very frequent involvement (&gt;8 x/day &amp; activities performed most hours of the day).</td>
</tr>
<tr>
<td>4</td>
<td>Extreme (spends &gt; 8 hrs/day), or near constant involvement (too numerous to count and an hour rarely passes without engaging in several such activities).</td>
</tr>
</tbody>
</table>

7. INTERFERENCE DUE TO ACTIVITIES RELATED TO GAMBLING.
How much do the above activities interfere with your social/work (or role) functioning? Is there anything that you don’t do because of them? If currently not working determine how much performance would be affected if employed.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>Mild, slight interference with social or occupational activities, but overall performance not impaired.</td>
</tr>
<tr>
<td>2</td>
<td>Moderate, definite interference with social/occupational performance, but still manageable.</td>
</tr>
<tr>
<td>3</td>
<td>Severe, causes substantial impairment in social/occupational performance.</td>
</tr>
<tr>
<td>4</td>
<td>Extreme, incapacitating.</td>
</tr>
</tbody>
</table>
8. DISTRESS ASSOCIATED WITH BEHAVIOR RELATED TO GAMBLING.
   How would you feel if prevented from performing these activities? (Pause) How anxious would you become?

   0 = None
   1 = Mild, only slightly anxious if behavior prevented, or only slight anxiety during the behavior.
   2 = Moderate, reports that anxiety would mount but remains manageable if behavior is prevented, or that anxiety increases but remains manageable during such behaviors.
   3 = Severe, prominent and very disturbing increase in anxiety if behavior is interrupted, or prominent and very disturbing increase in anxiety during the behavior.
   4 = Extreme, incapacitating anxiety from any intervention aimed at modifying activity, or incapacitating anxiety develops during behavior related to gambling.

9. RESISTANCE AGAINST GAMBLING.
   How much of an effort do you make to resist these activities? How much the patient resists behaviors may/may not correlate w/ ability to control them.

   2 = Makes some effort to resist.
   3 = Yields to almost all of these behaviors without attempting to control them, but does so with some reluctance.
   4 = Completely and willingly yields to all behaviors related to gambling.

10. DEGREE OF CONTROL OVER GAMBLING BEHAVIOR.
    How strong is the drive to gamble? How much control do you have over the behaviors associated with gambling-related activities?

    2 = Moderate control, strong pressure to gamble, must be carried to completion, can only delay with difficulty.
    3 = Little control, very strong drive to gamble, must be carried to completion, can only delay with difficulty.
    4 = No control, drive to gamble experienced as completely involuntary & overpowering, rarely able to even momentarily delay gambling activity.

Rater’s Initials ______ ______ ______

Total Score ______ ______
ii) Gambling Symptom Assessment Scale

**G-SAS**

The following questionnaire is aimed at evaluating gambling symptoms. Please *read* the questions *carefully* before you answer. Please circle the most appropriate number:

1) If you had urges to gamble during the past WEEK, on average, how strong were your urges?
   0 - None
   1 - Mild
   2 - Moderate
   3 - Severe
   4 - Extreme

2) During the past WEEK, how many times did you experience urges to gamble?
   0 - None
   1 - Once
   2 - Two to three times
   3 - Several to many times
   4 - Constant or near constant

3) During the past WEEK, how many hours (add up hours) were you preoccupied with your urges to gamble?
   0 - None
   1 - 1 hr or less
   2 - 1 to 7 hr
   3 - 7 to 21 hr
   4 - over 21 hr

4) During the past WEEK, how much were you able to control your urges?
   0 - Complete
   1 - Much
   2 - Moderate
   3 - Minimal
   4 - No control

5) During the past WEEK, how often did thoughts about gambling and placing bets come up?
   0 - None
   1 - Once
   2 - Two to four times
   3 - Several to many times
   4 - Constantly to near constantly

6) During the past WEEK, approximately how many hours (add up hours) did you spend thinking about gambling and thinking about placing bets?
   0 - None
   1 - 1 hr or less
   2 - 1 to 7 hr
   3 - 7 to 21 hr
   4 - over 21 hr
7) During the past WEEK, how much were you able to control your thoughts of gambling?
   0 - Complete
   1 - Much
   2 - Moderate
   3 - Minimal
   4 - None

8) During the past WEEK, approximately how much total time did you spend gambling or on gambling-related activities?
   0 - None
   1 - 2 hr or less
   2 - 2 to 7 hr
   3 - 7 to 21 hr
   4 - over 21 hr

9) During the past WEEK, on average, how much anticipatory tension and/or excitement did you have shortly before you engaged in gambling? If you did not actually gamble, please estimate how much tension and/or excitement you believe you would have experienced, if you had gambled?
   0 - None
   1 - Minimal
   2 - Moderate
   3 - Much
   4 - Extreme

10) During the past WEEK, on average, how much excitement and pleasure did you feel when you won on your bet? If you did not actually win at gambling, please estimate how much excitement and pleasure you would have experienced, if you had won.
    0 - None
    1 - Minimal
    2 - Moderate
    3 - Much
    4 – Extreme

11) During the past WEEK, how much emotional distress (mental pain or anguish, shame, guilt, embarrassment) has your gambling caused you?
    0 - None
    1 - Mild
    2 - Moderate
    3 - Severe
    4 - Extreme

12) During the past WEEK, how much personal trouble (relationship, financial, legal, job, medical or health) has your gambling caused you?
    0 - None
    1 - Mild
    2 - Moderate
    3 - Severe
    4 – Extreme
iii) Problem Gambling Clinical Global Index

**PG – CGI**

**Severity of Illness**

Considering your total clinical experience with this particular population, how severe are this patient’s symptoms at this time?

0 – Not Assessed
1 – No Pathology
2 – Minimal
3 – Mild
4 – Moderate
5 – Moderate Severe
6 – Severe
7 – Extreme

**Global Improvement**

Rate the total improvement whether or not, in your judgement, it is due entirely to clinical treatment. Compared to the patient’s condition at admission to the study, how much has the patient changed:

0 – Not Assessed
1 – Very much improved
2 – Much improved
3 – Minimally improved
4 – No change
5 – Minimally worse
6 – Much worse
7 – Very much worse

Clinician-Rated  Patient-Rated

_________________  ___________
iv) Patient Rated Cognitive Measures (Ladouceur et al, 2002)

PERCEPTION OF CONTROL

To what extent do I perceive that my gambling problem is under control?

<table>
<thead>
<tr>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all</td>
<td>a little</td>
<td>moderately</td>
<td>very much</td>
<td>completely</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

DESIRE TO GAMBLE

What is my desire to gamble today?

<table>
<thead>
<tr>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>non-existent</td>
<td>weak</td>
<td>average</td>
<td>high</td>
<td>very high</td>
<td></td>
<td></td>
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</table>

SELF-EFFICACY PERCEPTION

To what extent do I perceive myself as being able to abstain from gambling?

<table>
<thead>
<tr>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
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