A Controlled Evaluation of Cognitive Therapy for Problem Gambling: Final Report

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Abstract

One of the greatest challenges facing the societal response to the growing number of individuals with clinically significant problem gambling is the development of effective treatments. The strongest support (albeit far from persuasive) can be found for cognitive and behavioural therapies for pathological gambling. Based on the growing awareness of the role of dysfunctional thinking in pathological gambling, the cognitive approach shows particular promise. This study evaluated the efficacy of cognitive therapy. Three control groups were included: behavioural treatment, motivational therapy, and a minimal intervention. Participants, recruited from the community were randomly assigned to the four treatments. Except for the minimal intervention, which consisted of one two-hour session, the three treatments were delivered over six sessions. Follow-up took place at three and 12 months post-treatment. No group differences on the key gambling indicators were found. However, the overall sample improved as a result of treatment. Nevertheless, a substantial proportion of the sample continued to experience gambling problems. The main hypothesis predicting superior efficacy of cognitive therapy was not supported.

Key Words: gambling, psychological treatment, cognitive therapy

Executive Summary

- The goal of this study was to evaluate cognitive therapy against three other brief treatments (behavioural, motivational, and minimal).
- The sample was recruited from the community.
- A total of 99 subjects entered treatment; 92 completed end-of-treatment assessment; 86 completed the three-month follow-up assessment; 73 completed the 12-month assessment.
- The sample was primarily male, middle-aged, non-partnered, under-employed and moderately educated.
- Gambling problems were most frequently reported for casino games, slot machines, and the racetrack.
- Previous psychiatric history and addiction problems were common.
- In the sample, 80% met diagnostic criteria for pathological gambling.
- There were no baseline group differences on cognitive distortions, high-risk situations, relationship satisfaction and problem-solving skills.
- There were no group differences following treatment; the sample as a whole improved significantly.
- The results showed a significant reduction in gambling diagnostic severity, gambling frequency, gambling expenditures, cognitive distortions and emotional symptoms at three- and 12-month follow-up.
- In general, all groups were effective; there were no salient group differences.
- Based on these preliminary findings, brief interventions are effective in significantly reducing gambling symptoms. However, no treatment was superior to any other.
- The one-session intervention was as effective as the six-session interventions and suggests that non-specific factors are important in determining clinical outcomes.
- Future treatment research may benefit from focusing on ways of enhancing very brief interventions as a first level of intervention.

Introduction

Current Status of Pathological Gambling Treatment Research

With prevalence estimates of problem gambling ranging between 1 and 2% of the population (see Shaffer, Hall, & Vanderbilt, 1997 for a comprehensive critical review of the North American gambling prevalence literature), there is an urgent need for effective treatments for this increasingly common psychiatric disorder. Although the history of gambling treatment dates back almost 40 years, there is a surprising lack of solid knowledge of what constitutes effective treatment for pathological gambling. The majority of gambling treatment research has consisted of small samples, uncontrolled interventions, and case studies from which little can be definitively concluded. Walker (1992) has reviewed the early gambling treatments based on social learning and conditioning theory and estimated the overall success rate to be about 23%. The few studies that have used appropriate control groups with sufficient sample sizes have tended to employ cognitive-behavioural strategies, and have successfully obtained long-term improvements in gambling of between 50 to 75% (e.g., Echeburua et al., 1996; Sylvain & Ladouceur, 1997; McConaghy, Blaszczynski, & Frankova, 1991; McConaghy, Armstrong, Blaszczynski, & Allcock, 1983, 1988). A review of the controlled treatment literature has found the best evidence and support for cognitive-behavioural treatment approaches (Toneatto & Ladouceur, 2003; Toneatto & Millar, 2004). Similar findings have been reported by Korn and Shaffer (2004) in their report, *Practice Guidelines for Treating Gambling-Related Problems: An Evidence-based Treatment Guide for Clinicians*. This is consistent with the persuasive scientific evidence for the general efficacy of cognitive-behavioural interventions for a wide range of clinical disorders (e.g., depression, anxiety, substance dependencies, and eating disorders). Consequently, there is good reason to expect that cognitive-behavioural models would be effective in the treatment of pathological gambling.

For the few studies that have been done, those with the best clinical outcomes have tended to be multimodal. Cognitive, behavioural, affective, and motivational components have commonly been combined, rendering it difficult to determine which interventions have been the most effective in promoting clinical change. Blaszczynski and Silove (1995), and Lopez-Viets and Miller (1997) have expressed concern with the tendency to combine several distinctive interventions within a treatment. This can be a serious weakness in the development of optimally effective treatment initiatives for pathological gambling. It is well known (e.g., Rush & Moxam, 2001) that gamblers remain committed to treatment for only brief periods of time, which indicates that the window of opportunity for administering a gambling treatment is narrow. Consequently, it is imperative that treatment be as effective, focused, and strategic as possible. This requires an understanding of the relative effectiveness of the distinctive components of delivered treatments. Developing and testing ‘pure’ forms of each therapy most effectively accomplishes this understanding, and is the primary purpose of this study.

Rationale for a Cognitive Treatment Model of Pathological Gambling

A considerable body of work has accumulated in recent years attesting to the ease with which non-gamblers and social gamblers readily adopt erroneous assumptions about the degree of control that is possible over chance-determined outcomes. Ladouceur and his colleagues (e.g., Ladouceur, Gaboury, Dumont, & Rochette, 1988; Ladouceur, Sylvain, Boutin, Lachance, Doucet, Leblond, & Jacques, 2001; Gaboury & Ladouceur, 1989) have experimentally demonstrated a high prevalence of erroneous verbalizations (e.g., attributing causal significance to variables correlated with gambling outcomes, predicting outcomes, explaining losses situationally but wins dispositionally) during episodes of gambling (e.g., blackjack, slot machines, video poker), in which outcomes were not under the control of the subjects. Gilovich and Douglas (1986) have described similar cognitive processes in sports betting, where losses during sporting events were attributed to unlikely or random events while wins were attributed to skill in choosing the winning team. Griffiths (1996), studying adolescent slot

machine gamblers, found evidence for distortions similar to those identified by Ladouceur and his colleagues. Regular slot machine players were more likely to report beliefs that skill was as important as chance in determining outcomes, and judged themselves to possess above average skills at playing slot machines than did non-regular players.

Recently, Toneatto and his colleagues (e.g., Toneatto, Blitz-Miller, Calderwood, Dragonetti, & Tsanos, 1997; Toneatto, 1999a, 2002) have described a wide range of cognitive distortions in a sample of heavy gamblers, including attribution biases, illusion of control, selective recall, instrumental beliefs about luck, and misinterpretation of cues (internal and external).

On the basis of this research, the core, primary cognitive distortion in gamblers was considered to be a *robust belief in the ability to predict or control the outcome of a future event which is, by definition, either randomly determined (e.g., slot machines, roulette, lotteries) or about which insufficient knowledge is available to make accurate predictions (e.g., sport lotteries, race tracks, card games)*. Gamblers believe that not only is there a way to predict, foretell, manipulate, anticipate or otherwise know the outcome of a future gambling event, they also believe that they possess or can discover such knowledge.

Although there is growing evidence of substantial cognitive psychopathology among problem gamblers (e.g., Griffiths, 1996; Walker, 1992, Ladouceur et al., 1988, Toneatto, 1999a), to date the empirical evidence for treatments based on a cognitive approach is growing with both case studies (Toneatto & Sobell, 1990; Sylvain & Ladoucer, 1992) and several randomized control studies (e.g., Sylvain et al., 1997; Ladouceur, et al. 2001) attesting to it's efficacy. Sylvain et al. (1997) found that a cognitive intervention targeting erroneous beliefs regarding randomness found significant reductions in gambling severity, frequency of gambling, and amount wagered, compared to the wait-list control group in a sample of 14 subjects. These results were maintained at a 12-month follow-up. Recently, Ladouceur et al., (2001) completed a randomized, controlled trial of individual cognitive therapy, in which 66 diagnosed gamblers (primarily slot machine and video gamblers) were assigned to either the experimental treatment or a waiting list control. Treated subjects received an average of 11 hours of therapy (maximum 20 sessions). Four components defined the treatment: understanding the concept of randomness, understanding the erroneous beliefs held by gamblers, awareness of inaccurate perceptions, and cognitive correction of erroneous perceptions. The overall results showed that, at post-test, the treated subjects met fewer diagnostic criteria, less desire to gamble, and higher perception of control over their gambling and perceived self-efficacy. This group also gambled less frequently, spent less money, and gambled fewer hours than the control group. On measures of clinically significant change and end-state functioning, virtually all the treated sample, and none of the wait-list control group, improved. When 80% of the treated sample was assessed at one-year follow-up, significant differences between pre-test and follow-up were found for the Diagnostic and Statistical Manual of Mental Disorders - Fourth edition (DSM-IV) criteria, perception of control, desire to gamble, and self-efficacy ratings. A very high proportion of the treated sample continued to show clinically significant change.

Echeburua, Baez, and Fernandez-Montalvo (1996), however, did not find the addition of cognitive therapy to be differentially more effective than either behavioural treatment or a combined cognitive-behavioural treatment in a randomly assigned sample of 64 gamblers. In addition, several other non-cognitive approaches to gambling treatment have been shown to be effective (e.g., Korn & Shaffer, 2004).

Purposes and Goals

There remains a need for well-controlled clinical trials to validly identify effective treatments for pathological gambling. This study is intended to address this need by conducting a controlled evaluation of cognitive therapy for pathological gambling.

The outcome of this study is expected to produce the most reliable data available on the actual effectiveness of several potentially effective treatments for pathological gambling. As such, this study may influence the theoretical models currently informing problem gambling treatment programs in Ontario, and set an evidence-based standard for the treatment of gambling. The effective treatments identified in this study could also be readily disseminated to clinicians treating problem in designated agencies throughout the province of Ontario, with the assistance of the specialized training offered by the Centre for Addiction and Mental Health (CAMH) Problem Gambling Training Project. In addition, the materials used in this study (i.e., the treatment manuals, questionnaires, and self-help manuals) represent disseminable products that will enhance and support such training.

Research Question

The primary research question that this study addresses is whether cognitive therapy is efficacious for problem gambling. This study represents an advance over prior research, and tests the efficacy of cognitive therapy by comparing it to other common treatment modalities for problem gambling.

Method

Participants

The subject sample consisted of 99 problem gamblers recruited from the Greater Toronto Area (GTA) through advertisements placed in local newspapers. Potential participants were initially screened over the phone to determine eligibility. Subjects who reported having a gambling problem and scored positively on at least one symptom on the DSM-IV criteria for pathological gambling, were actively gambling (past two weeks), and were not currently receiving any additional treatment for problem gambling, were eligible for the study.

Primary exclusion criteria included any severe psychiatric crisis (i.e., suicidality, psychosis, severe depression, and hypomania) requiring immediate attention, or acute psychosocial crisis (e.g., homeless, serious legal difficulty). Participants ineligible for the study were referred to the appropriate treatment services (e.g., Problem Gambling Service, Mood and Anxiety Clinic).

Assessment

Eligible subjects were invited to a baseline assessment session that consisted of gambling history, patterns of gambling, psychiatric history, current psychiatric symptoms, gambling treatment history, and substance use history. In addition, several questionnaires were administered, including:

- *Marital Satisfaction*: The **Relationship Assessment Scale** (RAS; Hendrick, 1988) measures satisfaction in relationships. This seven-item scale is quickly administered and is not limited only to romantic relationships. Acceptable internal consistency for this measure exists (alpha = .98).Good concurrent validity (high correlation with other relationship measures) and predictive validity (distinguishing between couples who stay together or break up) are also supportive. Norms for the RAS are available.

- *Problem-Solving Ability*: The **Problem-Solving Inventory** (PSI; Heppner & Petersen, 1982) is a 35-item instrument measuring how individuals believe they react to personal problems encountered in their daily lives. There are three sub-scales: problem-solving confidence, approach-avoidance style, and personal control. The instrument possesses good internal consistency (alphas range from .72 to .85 on the sub-scales and .90 for the entire test), and has good test-retest reliability. The validity of the PSI has also been extensively substantiated.

- *Psychiatric Symptomatology*: The **Brief Symptom Inventory** (BSI: Derogatis, 1983) is a 53-item scale measuring nine types of psychopathology within the past week, that correspond closely to several DSM-IV Axis-I disorders. The **Global Severity Scale**, based on the mean rating for all 53 items, is scored on a five-point scale ranging from 0 (“not at all”) to 4 (“extremely”), and provides an overall index of psychiatric distress. Norms on several clinical and non-clinical populations are available.

- *Dysfunctional Cognitions***:** The **Gambling Cognition Questionnaire** (GCQ**;** Toneatto, 1999b) is a 60-item instrument that measures maladaptive beliefs and attitudes held by the gambler that may have an impact on their gambling behaviour. The questionnaire is presented in a Likert-scale format, ranging from 1 (“I never do this”) to 5 (“I always do this”). Internal consistent reliability (Alpha = .95) and concurrent validity (i.e., correlation with the DSM-IV, measures of clinical stress, emotional distress, and gambling in high risk situations all exceed .40) are high (Toneatto, 1999b). Eight sub-scales have been defined (i.e., chasing, systems, luck control, instinct, reward fantasy, numbers, attitude, and ritualistic behaviour). Additional information on the psychometric properties of this instrument can be found in Toneatto (2002).

- *Stages of Change*: The **Readiness to Change Gambling Questionnaire** (RCGQ) is a 12-item instrument based on the *Stages of Change,* and evaluates how prepared the individual is to modify their gambling behaviour. Internal consistency has been shown to be high (alpha = .80), and the concurrent validity has been shown to be moderate to high (Toneatto, unpublished).

- *High Risk Situations*: The **Inventory of Gambling Situations (**IGS**)** is a 63-item instrument that measures the situations in which a gambler is most likely to gamble heavily. The IGS is composed of a four-point scale, ranging from 1 (“never”) to 4 (“almost always”). It has received extensive psychometric evaluation (Turner & Littman-Sharp, unpublished data) and yields scores on several clinically meaningful sub-scales. Alpha has been shown to be .98 and excellent concurrent validity (e.g., r = .77 with DSM –IV, clinical stress, r = .54, BSI, r = .52) has been reported (Toneatto, unpublished data).

Procedure

Experimental Group

Following the baseline assessment, subjects were randomly assigned to one of four groups. *Cognitive Therapy* [CT] was the experimental treatment based on the reported strong correlation between problem gambling and cognitive psychopathology and the supportive treatment research outcome data (e.g., Korn & Shaffer, 2004).

Control Groups

Behaviour Therapy (BT) served as an active control for CT, as it treated the gambling behaviour directly but avoided focusing on the cognitive symptoms of problem gambling. *Motivational Therapy* [MT] focused less on modifying behaviour directly, and instead clarified commitment to change, resolving ambivalence, and strengthening the participants’ inherent problem-solving skills. Thus, MT controlled for the non-specific effects of treatment. *Minimal Intervention* [MI] responded to the need for a brief, rapidly delivered treatment that is frequently preferred by problem gamblers. The key characteristic of this treatment rests on the assumption that many problem gamblers prefer to resolve their gambling problems on their own, with minimal professional input. This has been amply documented in the natural recovery literature (e.g., Toneatto et al., in press; Hodgins & el-Guebaly,

2000; Hodgins, Makarchuk, el-Guebaly, & Peden, 2002). The MI served as a control for professional treatment, per se, as the intervention provides practical feedback delivered within one session, and included components of the other treatments. Each of the four treatments is briefly described below.

Cognitive Therapy: The cognitive intervention treatment was based on a treatment model developed by Toneatto (2002). This focused on the identification and cognitive restructuring of key gambling-related distortions (Toneatto, 1999a), as identified on the GCQ. This cognitive model was heavily influenced by the work of Ladouceur and his colleagues (e.g., Ladouceur et al., 1988; 2001). The GCQ (Toneatto, 1999b) measured several categories of gambling-related dysfunctional thinking, such as illusion of control, superstitious behaviour, beliefs about luck, and faulty attributions. Strong reliability and validity of this instrument has been established (Toneatto, 1999b). The goal of CT is to weaken the gambler's core belief that they can reliably predict or control gambling outcomes, which by definition are either randomly determined (e.g., slot machines, roulette, lotteries) or about which insufficient knowledge is available to make accurate predictions. The key treatment elements included *awareness-raising, introduction of doubt, collaborative empiricism, rational evaluation of cognitive distortions,* and *metacognitive interventions*.

Behaviour Therapy: The behavioural intervention focused exclusively on action-oriented strategies designed to achieve four specific goals, including: (i) *stimulus control* - encouraging avoidance of gambling venues, socializing with other gamblers, and gambling-related stimuli; (ii) *coping with urges to gamble* - developing effective responses to cue-elicited temptations, (iii) *increasing behavioural reinforcement* - development of a gambling-free lifestyle that may include resumption of behaviours that have been neglected; and/or (iv) *strengthening social reinforcement* - resumption of supportive and positive social relationships with significant individuals, which can be critical in maintaining behaviour change. Behavioural approaches to treatment have received limited empirical support (Echeburua, Baez, & Fernandez-Montalvo, 1996; Echeburua, Fernandez-Montalvo, & Baez, 2000; McConaghy et al.,1991).

Motivational Therapy: The motivational intervention, modeled after Miller and Rollnick (1992) and Prochaska and DiClemente's (1984) *Stages of Change* model, was based on the assumption that the individual is able to make the necessary behavioural changes once the proper motivational state is present. The motivational model assumes that the major hindrance to cognitive and behaviour change is the gambler's motivational state. Individuals who are less willing to modify their behaviour are distinguished from those who have made a commitment to change or from those who have initiated or completed behaviour change. Therapeutic interventions should ideally correspond with the individual's stage of change, and aim to move them towards the action and maintenance of these stages of change. A key method for influencing the individual is to resolve the ambivalence that the gambler may maintain about the need to modify their gambling behaviour. This is often accomplished by *magnifying the discrepancy* between the client's goals and their present behaviour, *providing feedback* on the consequences of their gambling, *conducting a decisional balance analysis*, *clarifying values and goals*, and *removing obstacles* to behaviour change.

Minimal Intervention: This intervention was based on the well-substantiated finding within the addiction treatment field that minimal, advice-oriented treatments, often consisting of only one session, may be as effective as more intensive or prolonged treatments in mild to moderate alcohol problems (e.g., Chick et al., 1988). One of the few such studies in the gambling area (Dickerson, Hinchy, & England, 1990) found that a self-help manual produced significant reductions in gambling frequency and excessive wagering. The materials that will contribute to this intervention are derived from the study of natural or untreated recovery from addiction, a pathway to recovery that is being

increasingly studied (Sobell et al., 2000; Toneatto et al., in press). The MI consisted of the baseline assessment described above followed by a two-hour feedback session, during which the findings of the assessment were shared with the participant and practical advice was provided (along with a booklet of strategies).

The CT, BT, and MT treatments each consisted of six sessions to reflect the clinical evidence that has indicated that problem gamblers prefer brief treatments (Toneatto & Dragonetti, submitted). For example, in the Toneatto et al. (unpublished) study, the mean number of sessions attended was approximately six despite the availability of additional treatment. Within the Problem Gambling Service at CAMH, the average number of sessions is between three and four (Littman-Sharpe, personal communication). This suggests that the opportunity to deliver effective treatment to clients may be limited. It is imperative that treatments be strategic (i.e., that they have a definite purpose or intention), efficient (i.e., avoid the inclusion of treatment components which may not contribute to efficacy), and empirically-grounded (i.e., that they rest on a validated model of the behaviour). Otherwise, the risk of high attrition, non-compliance, and relapse is considerable.

Internal Validity of the Study

Two therapists possessed Masters level degrees and two possessed doctoral degrees. All therapists were highly experienced in the cognitive-behavioural treatment of addictions, ranging between three and 15 years. Each therapist provided treatment for all four groups. The therapists (except for the PI) were blind to the study hypotheses. Training in the specific components of treatment was provided prior to beginning the study. In order to provide maximum flexibility within the parameters of each treatment, therapists were provided with the basic guidelines to deliver the treatment effectively and to avoid contamination with other treatments. Generally speaking, these guidelines delimited the general focus of the treatment (e.g., behavioural treatment) and the kinds of interventions consistent with this modality; specific instructions to avoid other types of interventions (e.g., cognitions, motivational) were provided. These guidelines were summarized in the draft manuals.

To avoid contamination and maintain individual integrity, none of the treatments explicitly included elements of the other interventions evaluated in this study. To increase the internal validity of the study, reduce variance, and increase the interpretability of the results, specific treatment guidelines were developed for each intervention, weekly meetings with all therapists were held to discuss each case, and checklists were used to guide each treatment session. In order to ensure fidelity of each treatment, study therapists were instructed to adhere closely to the key principles defining each treatment, even if this was not in the best interests of the client (i.e., a client who expressed a cognitive distortion but did not have it addressed, as they had been randomized to the behaviour therapy group). At weekly meetings, any threats to the internal validity of the treatment were discussed and resolved.

Post-Treatment Assessment

Following treatment completion or drop-out, participants were requested to complete the post-treatment assessment. These consisted of the Gambling Behaviour Questionnaire (measuring frequency and gambling expenditures), BSI, GCQ, DSM-IV criteria for Pathological Gambling, and Treatment Evaluation Questionnaire.

Follow-Up Assessment

Participants were reassessed at three- and 12-months post-treatment on gambling variables (i.e., frequency, amount wagered) and key theoretical variables (i.e., cognitive distortions, psychiatric status). These variables were assessed for the month prior to the assessment. Ratings of treatment and overall service satisfaction were also obtained. At the follow-up assessments, the following questionnaires (covering the month prior to the assessment) were administered: GCQ, BSI, the DSM-

IV criteria for Pathological Gambling, and measures of confidence in controlling gambling, gambling urges and desires to gamble, and treatment efficacy. In addition, gambling patterns for the previous year were assessed at the 12-month follow-up.

Experimental Hypotheses and Data Analysis

The key hypotheses compared the four groups on the primary dependent variables (frequency of gambling, amount wagered, and DSM-IV criteria) at post-treatment and at the two follow-up points (three and 12 months post-treatment).

Hypothesis 1: At post-treatment, there will be no significant group differences on the primary dependent variables.

Hypothesis 2: At the three-month follow-up, group CT will be gambling and wagering significantly less frequently than groups BT, MT, and MI.

Hypothesis 3: At the 12-month follow-up, group CT will be gambling and wagering significantly less frequently than groups BT, MT, and MI.

An intent-to-treat analytic approach was adopted. Analysis of covariance was used as the primary analytic procedure (controlling for baseline values and treatment sessions attended) for most outcome variables (e.g., frequency, gambling expenditures, and DSM-IV criteria). In addition, 4 (GROUP) X 4 (TIME) or 3 (TIME) repeated measures of analysis of variance were conducted on key dependent variables. Multivariate analytic approaches were avoided due to the missing data for some dependent variables at the follow-up, and the fact that not all dependent variables were assessed at each time point. Linear regression was used to predict gambling frequency and gambling expenditures at 12-months post-treatment. Two-tailed paired t-tests were used to evaluate change over time across groups.

Results

Definition of Treatment Completers

Participants who completed at least 50% of the CT, BT, and MT groups were considered treatment completers (i.e., the MI group only attended one session). Of the 99 subjects who began treatment, 79 (80%) were considered completers. Twelve (12%) subjects did not attend any sessions and eight (8%) attended one or two sessions, despite having been assessed and randomized to treatment. Statistical analyses included all subjects (n = 99) who were randomized. Differences in the number of sessions attended were statistically controlled for.

Table 1 shows the number of subjects who were available for assessment at end-of-treatment, the three-month follow-up, and the 12-month follow-up. Over 90% of the sample was available at end-of-treatment, with three-quarters available at the one-year post-treatment assessment.

Table 1: Sample sizes

Variable	*Cognitive Therapy*	*Behaviour Therapy*	*Motivational Therapy*	*Minimal Intervention*	*Total*
Baseline	25	24	22	28	99
End-of-Treatment (% of baseline)	22 (88)	24 (100)	19 (86)	27 (96)	92 (93)
3-Month Follow-Up (% of baseline)	20 (80)	22 (92)	17 (77)	27 (96)	86 (87)
12-Month Follow-Up (% of baseline)	18 (72)	17 (71)	15 (68)	23 (82)	73 (74)

Sample Description

There were no pre-treatment GROUP differences on any demographic variable, indicating the randomization procedure was successful (see Table 2). In general, the sample was primarily male, middle-aged, non-partnered, under-employed, and moderately educated. Approximately 11 years separated the age that regular gambling began and the onset of a self-reported gambling problem; about a dozen years elapsed between the onset of a gambling problem and treatment-seeking.

Table 2: Description of the sample

Variable	*Cognitive Therapy*	*Behaviour Therapy*	*Motivational Therapy*	*Minimal Intervention*	*Total*
% Male	80.0	70.8	77.3	67.9	73.7
M (SD) Age	46.7 (11.1)	49.5 (13.9)	48.6 (15.6)	45.5 (13.5)	47.5 (13.5)
% Married or Common-Law	29.2	50.0	27.3	42.9	37.8
% Secondary Education	41.7	50.0	54.5	39.3	45.9
% Employed	58.3	58.3	59.1	46.4	55.1
M (SD) Age First Gambling Problem	35.4 (12.7)	35.8 (13.9)	33.7 (16.5)	35.1 (15.4)	35.0 (14.5)
M (SD) Age First Gambling	24.6 (11.0)	24.6 (13.4)	23.0 (14.1)	24.3 (11.2)	24.1 (12.3)

Description of Gambling Behaviour

Table 3 displays the proportions of each group reporting gambling problems at the time of assessment and at the 12-month follow-up. The most frequently reported problem games at baseline included slot machines, casino card games, racetrack betting, and lotteries. The sample reported a mean (SD) of 2.9 (2.5) problem games per gambler, suggesting that multiple gambling problems were common. No GROUP difference in problem games per gambler was found ($F_{(3, 98)} = 1.74$, *ns*), nor was there a difference in the number of gambling activities engaged in ($F_{(3, 86)} = 0.28$, *ns*) at baseline.

Table 3: Proportion of total sample reporting problems with various types of gambling at baseline and 12-month follow-up assessment

% Gambling with	***Baseline***	***12-Month Follow-Up***	***Chi-square Value****
Lotteries	32.3	6.9	13.4
Scratch Tickets	25.8	6.1	14.6
Pull Tabs	11.7	1.4	23.0
Private Card Games	8.5	2.8	ns
Casino Dice Games	18.5	2.8	11.5
Casino Card Games	35.1	6.8	25.3
Casino Video Games	17.2	7.0	23.6
Internet	4.3	4.3	ns
Investment	6.5	4.2	19.5
Racetrack	34.4	19.7	31.3
Sports Lotteries	20.2	12.7	45.9
Sport Betting	11.8	4.2	16.9

% Gambling with	*Baseline*	*12-Month Follow-Up*	*Chi-square Value**
Bingo	16.0	4.2	29.6
Slot Machines	50.5	25.4	22.6
M (SD) Number of Games Played	4.9 (3.1)	1.1 (1.6)	9.74**
M (SD) Number of Games Rated as Problematic	2.9 (2.5)	1.1 (1.6)	5.51***

*4 degrees of freedom; all coefficients significant at $p < .05$.
**t-value, df=61, significant at $p < .0001$. ***df = 70

At end-of-treatment, the most common types of gambling reported were slot machines, (24.4% of sample), lottery (14.4%), and casino games (11.1%). No gambling at all was reported by 21% of the sample.

At the 12-month follow-up, the most commonly reported games were slot machines and race-track betting. A mean (SD) of 1.1 (1.6) games was reported to be problematic at the follow-up, but there was no significant GROUP differences in the number of problem games ($F_{(3, 70)} = 1.25$, *ns*) or in the number of games engaged in ($F_{(3, 68)} = 0.58$, *ns*). However, significant reductions were observed for all types of gambling between baseline and the 12-month follow-up, except for private card games and internet gambling.

Table 4 shows the frequency with which each type of gambling occurred during the year prior to the baseline assessment and the 12-month follow-up assessment. Lotteries, scratch tickets, sports lotteries, and race-track gambling were the most frequently occurring games. Significant reductions were reported for most games between baseline and follow-up, except for private card gambling, dice games, internet gambling, stock market gambling, and sport betting. An examination of the means in Table 4 indicates a reduction of at least 50% for most gambling types.

Table 4: Frequency (in the previous year) of various types of gambling at baseline and follow-up

Yearly Frequency of:	*Baseline*	*12-Month Follow-Up*	*t-value**
Lotteries	95.5 (122.1)	43.6 (59.4)	3.36
Scratch Tickets	63.0 (105.6)	33.1 (81.9)	2.76
Pull Tabs	25.2 (74.5)	9.0 (49.4)	2.70
Private Card Games	16.8 (59.9)	1.9 (7.8)	ns
Casino Dice Games	19.0 (43.0)	3.3 (21.2)	ns
Casino Card Games	27.2 (62.1)	7.0 (23.1)	2.28
Casino Video Games	17.0 (42.6)	5.6 (35.1)	ns
Internet	14.4 (62.2)	1.3 (4.8)	ns
Investment	3.6 (20.4)	1.3 (8.0)	ns
Racetrack	56.0 (106.3)	23.0 (49.8)	3.72
Sports Lotteries	47.8 (106.0)	29.3 (84.1)	2.11
Sport Betting	17.5 (68.4)	2.1 (8.0)	ns
Bingo	16.0 (46.1)	3.6 (12.8)	2.50
Slot Machines	39.3 (62.6)	14.9 (43.0)	2.93

*two-tailed paired test comparing the follow-up and baseline frequencies; all coefficients significant at $p < .05$; degrees of freedom range between 42 and 52.

Previous Psychiatric / Treatment History

There were no GROUP differences on any treatment history variable, including Gamblers Anonymous (GA), psychiatric treatment, or addiction treatment. As shown in Table 5, about one-

quarter of the sample had previously attended GA. Contact with a psychiatrist was reported by about one in four subjects. Treatment with psychotropic medications was quite prevalent, specifically anxiolytics (30.6% of the sample) and anti-depressants (21.4% of the sample), indicating considerable psychiatric comorbidity. At the 12-month follow-up, approximately one in six subjects reported contact with the mental health system, and one in five subjects had been prescribed psychotropic medications. These rates resemble the rates reported at baseline.

Table 5: Personal and familial treatment history

% Ever	*Cognitive Therapy*	*Behaviour Therapy*	*Motivational Therapy*	*Minimal Intervention*	*Total*
Attended Gamblers Anonymous	22.2	30.4	42.1	20.0	28.8
% Ever Treated					
On psychiatric unit	12.5	4.2	18.2	7.1	10.2
For alcohol problem	4.2	8.3	18.2	3.6	8.2
For other addiction	8.3	4.2	9.1	7.1	7.1
By a psychiatrist	16.7	29.2	40.9	10.7	23.5
By a psychotherapist	20.8	37.5	40.9	32.1	32.7
With anxiolytic	16.7	33.3	45.5	28.6	30.6
With anti-depressant	12.5	33.3	31.8	10.7	21.4
With neuroleptic	0.0	4.3	4.5	3.6	3.1
% of Immediate Family Ever Treated					
On psychiatric unit	8.3	13.0	22.7	10.7	13.4
By a psychiatrist	8.3	21.7	22.7	10.7	15.5
For addiction	12.5	26.1	14.3	7.1	14.6
% of Immediate Family Ever					
With addiction problem	29.2	47.8	45.5	28.6	37.1
With gambling problem	25.0	39.1	31.8	28.6	30.9
% in 12-M Post-Treatment					
Sought psychiatric treatment	0	29.4	26.7	13.0	16.4
Attended Gamblers Anonymous	11.1	23.5	14.3	4.3	12.5
Sought other gambling-specific treatment	0	17.6	14.3	0	6.9
Prescribed anti-depressant	11.1	35.3	20.0	13.6	19.4
Prescribed anxiolytics	5.6	31.3	20.0	21.7	19.4

Familial pathological gambling and addiction histories were common. About a third of the sample reported such a history, suggesting biopsychosocial contributions to the development of the gambling behaviour.

These data indicate that this sample's gambling difficulties occur within a history of emotional dysfunction and a social environment characterized by considerable addictive behaviour and emotional disturbance.

Gambling High-Risk Situations

Table 6 shows the means for 12 sub-scales of the IGS (Turner & Littman-Sharp, unpublished), a measure of gambling high-risk situations. No GROUP differences were observed for any of the sub-scales.

Table 6: IGS sub-scale scores

Sub-Scale	*Cognitive Therapy*	*Behaviour Therapy*	*Motivational Therapy*	*Minimal Intervention*	*Total*
Negative Affect	2.2 (0.8)	2.4 (0.8)	2.3 (0.9)	2.0 (0.7)	2.2 (0.8)
Interpersonal Conflict	1.8 (0.8)	1.8 (0.6)	1.7 (0.6)	1.5 (0.5)	1.7 (0.6)
Urges and Temptations	2.7 (0.6)	2.8 (0.6)	3.0 (0.5)	2.7 (0.7)	2.8 (0.6)
Testing Control	2.4 (0.8)	2.3 (0.7)	2.4 (0.4)	2.2 (0.7)	2.3 (0.7)
Pressure from Others	2.2 (0.5)	2.2 (0.6)	2.2 (0.4)	2.1 (0.5)	2.2 (0.5)
Positive Affect	2.5 (0.8)	2.6 (0.7)	2.8 (0.5)	2.7 (0.7)	2.6 (0.7)
Social Situations	1.7 (0.7)	1.8 (0.7)	2.0 (0.8)	2.1 (0.7)	1.9 (0.1)
Wanting Excitement	2.8 (0.6)	2.8 (0.7)	3.0 (0.4)	2.8 (0.7)	2.8 (0.6)
Worry Over Money	2.0 (0.8)	2.1 (0.7)	2.0 (0.8)	1.9 (0.9)	2.0 (0.8)
Chasing Losses	2.7 (0.8)	2.7 (0.8)	2.8 (0.6)	2.9 (0.8)	2.8 (0.7)
Skill Situations	2.7 (0.7)	2.6 (0.9)	2.9 (0.6)	2.7 (0.7)	2.7 (0.7)
Social Control	2.3 (0.8)	2.0 (0.8)	2.2 (0.7)	1.8 (0.6)	2.0 (0.7)

Scores range from (1) never to 4 (almost always).

The high-risk situations that were rated as "*frequently"* leading to heavy gambling included *urges and temptations, wanting excitement*, and *chasing losses*. Situations that "*rarely"* led to heavy gambling included *interpersonal conflict, social situations, social control*, and *worry over money*.

Relationship Status and Problem-Solving Skills

Table 7 shows the means for the RAS, RCGQ, and the PSI. No GROUP differences were observed for any of the scales. The sample as a whole expressed average satisfaction with their significant relationships.

An ANCOVA on the RAS at the 12-month follow-up showed no GROUP difference ($F_{(3, 35)}$ = .51, *ns*). No change was found between baseline and follow-up RAS scores. Mean RAS scores indicated an average level of relationship satisfaction. Thus, change in gambling behaviour did not directly impact on relationship satisfaction.

Table 7: PSI and RAS scores

Scale	*Cognitive Therapy*	*Behaviour Therapy*	*Motivational Therapy*	*Minimal Intervention*	*Total*
Problem Solving Inventory					
Approach-Avoidance	52.4 (14.5)	52.5(11.6)	52.7 (10.3)	48.7(14.4)	51.4(12.9)
Conflict	32.6(11.9)	31.5(7.1)	31.7(7.0)	27.0(10.7)	30.5(9.7)
Control	19.5(6.2)	20.2(4.9)	20.1(3.7)	17.4(6.4)	19.2(5.5)
Stage of Change					
%Action	12.5	16.7	9.1	21.4	15.3
Relationship Assessment Scale					
baseline*	3.2(0.6)	3.1 (0.5)	3.4 (0.4)	3.2 (0.5)	3.2(0.5)
12M follow-up**	3.6 (0.4)	3.2 (0.5)	3.0 (0.6)	3.1 (0.6)	3.2 (0.5)

*n= 48; **n=36

Scores on the three sub-scales of the PSI (problem-solving confidence, approach-avoidance style, and personal control) suggest that this sample resembles other clinical populations (e.g., inpatient males with alcohol problems, Larson & Heppner, 1989; generalized anxiety disorders, Ladouceur et al., 1998). The majority of the sample was in the contemplation stage of change (approximately 85%); no GROUP differences were found.

Gambling-Related Cognitive Distortions

An ANCOVA on the eight sub-scales of the GCQ revealed no GROUP differences in cognitive distortions at baseline ($\underline{F}_{(3,97)} = 0.78$, *ns*) or at the 12-month follow-up ($\underline{F}_{(3,56)} = 1.07$, *ns*). However, the 12-month total GCQ score, when controlling for baseline GCQ score, approached significance ($\underline{F}_{(3,51)} = 2.64$, $\underline{p} < .06$). Controlling for the number of sessions attended eliminated this effect ($\underline{F}_{(3,50)} = 2.05$, *ns*), suggesting that treatment attendance modified the relationship between cognitive distortions and group status.

A reduction in distortions across groups was observed between baseline and the three-month follow-up ($\underline{t}$ (78) = 3.97, $\underline{p} < .0001$), and between baseline and the 12-month follow-up, ($\underline{t}$ (55) = 3.38, $\underline{p} < .001$). This suggests that the participants' cognitive distortions were significantly reduced by treatment, in general.

A 4 (GROUP) X 3 (TIME) repeated measures analysis of variance on the total GCQ score revealed findings consistent with those described above (see Table 12), with a significant time effect but neither a significant GROUP nor a GROUP X TIME effect.

In addition to the total score, an examination of all eight sub-scales of the GCQ showed significant reductions in frequency between baseline and the 12-month follow-up across groups: *Attitude Control*, $\underline{t}$ (54) = 2.71, $\underline{p} < .01$; *Luck Control*, $\underline{t}$ (54) = 2.01, $\underline{p} < .05$; *Gut Instincts*, $\underline{t}$ (54) = 3.74, $\underline{p} < .0001$; *Numbers*, $\underline{t}$ (55) = 2.22, $\underline{p} < .05$; *Chasing Losses*, $\underline{t}$ (55) = 6.47, $\underline{p} < .0001$; *Reward Fantasy*, $\underline{t}$ (55) = 3.82, $\underline{p} < .0001$; *Ritualistic Behaviour*, $\underline{t}$ (55) = 4.27, $\underline{p} < .0001$; *Wagering Systems*, $\underline{t}$ (55) = 2.54, $\underline{p} < .05$ (see Table 8).

Table 8: GCQ sub-scale scores

Sub- Scale	***Cognitive Therapy***	***Behaviour Therapy***	***Motivational Therapy***	***Minimal Intervention***	***Total***
Chasing Losses					
Baseline	3.5 (0.9)	3.6 (0.9)	3.6 (0.7)	3.5 (1.0)	3.5 (0.9)
3 Month Follow-Up	2.4 (1.1)	3.1 (1.0)	2.7 (0.8)	2.9 (1.7)	2.8 (1.3)
12 Month Follow-Up	2.4 (0.9)	3.1 (0.7)	3.0 (0.7)	2.7 (1.0)	2.7 (0.9)
Attitude Control					
Baseline	3.9 (0.9)	3.6 (1.0)	3.7 (0.7)	4.0 (0.9)	3.8 (0.9)
3 Month Follow-Up	2.8 (1.2)	3.5 (1.2)	3.2 (1.2)	3.5 (1.5)	3.3 (1.3)
12 Month Follow-Up	3.5 (1.2)	3.6 (1.3)	3.9 (0.6)	3.4 (1.2)	3.4 (1.2)
Reward Fantasy					
Baseline	3.8 (1.1)	3.7 (1.0)	3.7 (0.9)	4.0 (1.0)	3.8 (1.0)
3 Month Follow-Up	2.9 (1.0)	3.7 (1.0)	3.1 (1.0)	3.4 (1.7)	3.3 (1.3)
12 Month Follow-Up	3.2 (1.3)	3.4 (1.1)	3.5 (0.6)	3.1 (1.1)	3.3 (1.1)
Ritualistic Behaviour					
Baseline	2.3 (1.0)	2.1 (0.8)	2.2 (0.6)	2.5 (0.9)	2.3 (0.9)
3 Month Follow-Up	1.8 (0.9)	1.9 (0.6)	1.7 (0.8)	2.1 (1.6)	1.9 (1.1)
12 Month Follow-Up	1.8 (0.8)	1.8 (0.7)	1.9 (0.4)	1.6 (0.6)	1.7 (0.6)
Wagering Systems					
Baseline	3.4 (0.9)	2.9 (1.0)	3.3 (1.1)	3.3 (1.2)	3.2 (1.1)
3 Month Follow-Up	2.4 (1.0)	2.9 (1.0)	3.1 (1.2)	2.9 (1.8)	2.8 (1.4)
12 Month Follow-Up	3.0 (1.2)	2.8 (1.4)	3.3 (1.0)	2.5 (1.2)	2.8 (1.2)
Gut Instincts					
Baseline	3.7 (1.1)	3.7 (0.7)	3.4 (0.7)	3.8 (1.0)	3.7 (0.9)
3 Month Follow-Up	2.6 (1.2)	3.7 (0.9)	2.8 (0.8)	3.6 (1.7)	3.2 (1.4)
12 Month Follow-Up	2.6 (1.2)	3.1 (1.1)	3.2 (0.6)	3.3 (1.2)	3.0 (1.1)
Numbers					

Sub- Scale	Cognitive Therapy	Behaviour Therapy	Motivational Therapy	Minimal Intervention	Total
Baseline	2.4 (1.3)	2.2 (1.0)	1.9 (0.8)	2.6 (1.3)	2.3 (1.1)
3 Month Follow-Up	1.9 (1.0)	2.0 (0.9)	1.7 (0.7)	2.4 (1.9)	2.0 (1.3)
12 Month Follow-Up	2.0 (1.1)	2.1 (0.9)	1.8 (0.9)	1.9 (1.0)	1.9 (1.0)
Luck Control					
Baseline	3.1 (1.0)	2.8 (1.0)	3.1 (0.9)	3.3 (1.1)	3.1 (1.0)
3 Month Follow-Up	2.2 (1.0)	2.7 (0.9)	2.6 (0.7)	3.0 (1.7)	2.7 (1.3)
12 Month Follow-Up	2.6 (0.8)	3.5 (0.7)	2.7 (0.9)	2.5 (0.9)	2.8 (0.9)

Scores range from 1 (I never do this) to 5 (I always do this).

The number of GCQ sub-scales that improved significantly between baseline and the 12-month follow-up varied by GROUP. Seven of eight GCQ subscales for group MI showed significant reductions compared to only two for group CT (where one might have expected the largest effect), one for group MT, and none for group BT. These results suggest that the effect of treatment on gambling-related cognitive distortions was not specific to the modality that ostensibly targeted cognitive distortions (i.e., cognitive therapy). Instead, the largest impact on cognitive distortions occurred in those receiving the one-session minimal intervention.

It is possible that individuals who attended this one session and who received a cognitive intervention as a component of treatment during this session benefited to a greater degree than those who had received six sessions of cognitive therapy. This may reflect diminishing motivation for treatment over time that might render professional interventions less effective. This supports the importance of timely interventions for problem gamblers provided early in treatment, when motivation to change might be highest.

Current Emotional Distress

An ANCOVA on the BSI total scores at the end-of-treatment and at the 12-month follow-up (controlling for baseline BSI total scores), revealed no significant GROUP difference at either time point ($F_{(3, 75)} = 1.02$, *ns*; $F_{(3,74)} = 2.02$, *ns*, respectively). These group results were not altered when the number of treatment sessions attended were also controlled for ($F_{(3, 74)} = 0.40$, *ns*; $F_{(3,73)} = 1.29$, *ns*, respectively).

Paired within-subjects sample t-tests showed a significant reduction between baseline BSI and three-month follow-up BSI total scores (M (SD) = 1.91 (0.69) vs. M (SD) = 1.66 (.70), t (78) = -3.98, $p < .0001$), but not between the end-of-treatment and three-month follow-up BSI total scores (t (69) = -.26, *ns*). Furthermore, all nine sub-scales of the BSI showed significant reductions between baseline and end-of-treatment, but not between end-of-treatment and the three-month follow-up.

Table 9: BSI sub-scale scores

Sub-Scale	Cognitive Therapy	Behaviour Therapy	Motivational Therapy	Minimal Intervention	Total
Anxiety					
Baseline	2.1 (1.0)	2.2 (1.0)	1.9 (0.6)	1.5 (0.5)	1.9 (0.8)
End of Treatment	1.5 (0.7)	1.8 (0.9)	1.6 (0.5)	1.5 (0.8)	1.6 (0.7)
3 Month Follow-Up	1.5 (0.8)	2.0 (0.9)	1.9 (0.9)	1.4 (0.7)	1.6 (0.8)
Somatization					
Baseline	1.7 (0.8)	1.9 (0.9)	1.7 (0.6)	1.3 (0.5)	1.7 (0.7)
End of Treatment	1.5 (0.7)	1.6 (0.9)	1.3 (0.3)	1.3 (0.5)	1.4 (0.6)
3 Month Follow-Up	1.4 (0.7)	1.6 (0.9)	1.3 (0.3)	1.3 (0.5)	1.4 (0.6)
Psychoticism					

Sub-Scale	Cognitive Therapy	Behaviour Therapy	Motivational Therapy	Minimal Intervention	Total
Baseline	1.9 (0.8)	2.2 (0.9)	1.7 (0.6)	1.4 (0.6)	1.8 (0.8)
End of Treatment	1.7 (0.8)	1.7 (0.9)	1.7 (0.6)	1.4 (0.8)	1.6 (0.8)
3 Month Follow-Up	1.5 (0.7)	1.9 (1.0)	1.8 (0.7)	1.4 (0.6)	1.6 (0.8)
Paranoid Ideation					
Baseline	2.3 (1.0)	2.2 (0.9)	1.9 (0.6)	1.6 (0.5)	2.0 (0.8)
End of Treatment	1.8 (0.9)	1.9 (0.9)	1.7 (0.5)	1.5 (0.7)	1.7 (0.8)
3 Month Follow-Up	1.7 (0.8)	2.0 (0.8)	1.8 (0.6)	1.5 (0.6)	1.7 (0.7)
Obsessive-Compulsive					
Baseline	2.4 (1.0)	2.3 (0.9)	2.2 (0.6)	1.6 (0.5)	2.1 (0.8)
End of Treatment	1.9 (0.9)	1.9 (0.9)	2.0 (0.5)	1.6 (0.8)	1.8 (0.8)
3 Month Follow-Up	1.9 (1.0)	2.1 (0.9)	2.2 (0.9)	1.5 (0.7)	1.9 (0.9)
Interpersonal Sensitivity					
Baseline	2.2 (1.1)	2.3 (0.9)	1.9 (0.7)	1.4 (0.4)	1.9 (0.9)
End of Treatment	1.9 (0.8)	1.8 (0.8)	1.8 (0.8)	1.5 (0.7)	1.7 (0.8)
3 Month Follow-Up	1.7 (0.9)	2.0 (0.9)	1.8 (1.0)	1.5 (0.7)	1.7 (0.9)
Hostility					
Baseline	1.9 (0.7)	2.0 (0.8)	1.9 (0.5)	1.6 (0.5)	1.8 (0.6)
End of Treatment	1.7 (0.8)	1.5 (0.6)	1.6 (0.8)	1.4 (0.7)	1.5 (0.7)
3 Month Follow-Up	1.6 (0.8)	1.7 (0.7)	1.8 (0.7)	1.5 (0.6)	1.6 (0.7)
Depression					
Baseline	2.2 (1.0)	2.3 (0.9)	2.1 (0.8)	1.9 (0.9)	2.1 (0.9)
End of Treatment	1.8 (0.9)	1.8 (0.9)	1.8 (0.6)	1.6 (1.1)	1.7 (0.9)
3 Month Follow-Up	1.8 (0.8)	2.2 (1.0)	2.0 (0.8)	1.7 (1.0)	1.9 (0.9)
Phobic Anxiety					
Baseline	1.6 (0.8)	1.8 (0.9)	1.3 (0.4)	1.0 (0.1)	1.4 (0.7)
End of Treatment	1.4 (0.7)	1.4 (0.8)	1.2 (0.4)	1.2 (0.3)	1.3 (0.6)
3 Month Follow-Up	1.4 (0.7)	1.5 (0.9)	1.5 (0.7)	1.1 (0.4)	1.4 (0.7)
Total Score					
Baseline	2.0 (0.8)	2.1 (0.8)	1.9 (0.4)	1.5 (0.4)	1.9 (0.7)
End of Treatment	1.7 (0.7)	1.7 (0.8)	1.6 (0.4)	1.4 (0.7)	1.6 (0.6)
3 Month Follow-Up	1.6 (0.7)	1.9 (0.8)	1.8 (0.7)	1.4 (0.5)	1.7 (0.7)

Scores range from 1 (not at all) to 5 (extremely).

Severity of Gambling Problems

Table 10 shows the baseline values for the DSM-IV pathological gambling criteria and the GA 20 Questions. There were no baseline GROUP differences. Subjects reported between six and seven symptoms with over 80% of the sample meeting DSM-IV diagnostic criteria for pathological gambling at baseline.

Table 10: Gambling diagnostic severity

Score	Cognitive Therapy	Behaviour Therapy	Motivational Therapy	Minimal Intervention	Total
M (SD) DSM (max=10)					
Baseline	6.3 (2.3)	7.1 (2.0)	6.6 (1.6)	6.0 (2.7)	6.5 (2.2)
3 month follow-up	2.7 (2.5)	3.5 (3.1)	2.6 (3.0)	2.3 (2.9)	2.8 (2.9)
12 month follow-up	3.7 (3.5)	3.6 (2.7)	4.3 (3.0)	2.9 (3.0)	3.6 (3.1)
% Diagnosed Pathological Gambling					

Score	*Cognitive Therapy*	*Behaviour Therapy*	*Motivational Therapy*	*Minimal Intervention*	*Total*
Baseline	80.0	83.3	90.9	71.4	80.8
3 month follow-up	25.0	36.4	23.5	29.6	29.1
12 month follow-up	38.9	41.2	53.3	39.1	42.5
M (SD) Twenty Questions (max=20)					
Baseline	12.1(5.6)	15.3 (4.2)	13.9 (4.2)	12.5 (5.2)	13.4 (5.0)

The proportion of each group meeting DSM-IV criteria for pathological gambling did not differ by GROUP at baseline, three-month follow-up, or 12-month follow-up ($\chi 2$ (6) = 4.29, *ns*; $\chi 2$ (6) = 10.04, *ns*; $\chi 2$ (6) = 4.88, *ns*). Table 10 displays only the percents for those who met DSM-IV criteria (i.e., $\geq$ five symptoms). While 81% of participants were pathological gamblers at baseline, 43% continued to meet DMS-IV criteria at the 12-month follow-up.

While this cannot be considered a satisfactory outcome, it should be placed within the appropriate context. The DSM-IV symptoms measure various consequences of gambling that may have been true earlier on in the year post-treatment, but not necessarily towards the end of the one-year follow-up period. As a result, it is difficult to discern whether the subjects may have been less likely to meet criteria had they been asked to evaluate their situation within the past six months, for example.

An ANCOVA on the number of DSM-IV symptoms endorsed at the 12-month follow-up, controlling for baseline DSM-IV scores, revealed no significant GROUP difference ($F_{(3, 68)} = 0.55$, *ns*). However, scores at 12-months post-treatment, M (SD) = 3.6 (3.1), were significantly lower than the baseline DSM-IV score, M (SD) = 6.3 (2.3), across groups, t (72) = 6.68, $p < .0001$.

A 4 (GROUP) X 3 (TIME) repeated measures analysis of variance of the total DSM-IV score revealed consistent findings with those described above (see Table 12), with a significant TIME effect but neither a significant GROUP nor GROUP X TIME effect.

A closer examination of individual DSM-IV symptoms showed a significant shift for symptom six (i.e., gambling to escape problems), endorsed by 75% of the sample at baseline, but by 47% at the 12-month follow-up ($\chi 2$ (1) = 7.89, $p < .01$). Similarly, a significant change was observed for symptom 10 (i.e., relying on others for money), endorsed by 58% of the sample at baseline, but by 40% at 12-month follow-up ($\chi 2$ (1) = 8.79, $p < .01$).

Frequency of Gambling

An ANCOVA on gambling frequency (i.e., percent of days gambled in the month prior to the end-of-treatment, the three-month follow-up, and at the 12-month follow-up), controlling for baseline gambling frequency, revealed no significant group differences at all three assessment points (F (3, 86) = 0.23, *ns*; F (3,74) = 0.54, *ns*; F (3,67) = 0.28, *ns*, respectively). These results were not altered when the number of sessions attended were also controlled for (F (3, 85) = 0.64, ns; F (3,73) = 1.61, *ns*; F (3,66) = 0.67, *ns*, respectively). Thus, treatment did not have a differential impact on frequency of gambling.

A 4 (GROUP) X 3 (TIME) repeated measures analysis of variance of gambling frequency score revealed consistent findings with those described above, with a significant TIME effect, but neither a significant GROUP nor GROUP X TIME effect.

However, two-tailed paired within-subjects sample t-tests showed that the reduction in percent of days gambling in the month prior to the baseline assessment (43.7%) compared to the percent of days gambling in the month prior to the 12-month follow-up (23.1%) was significant (t (71) = -5.13, $p < .0001$). However, there was no difference (and little change) between the three- (19.4%) and 12-month (21.6%) follow-ups (t (63) = 0.76, *ns*). Thus, treatment was generally effective in reducing gambling by approximately 50% by the end of treatment, which was maintained throughout the follow-up period.

Table 11 shows that abstinence rates increased by end-of-treatment, decreased somewhat at the three-month follow-up, and maintained throughout the follow-up period.

Table 11: Frequency of gambling and gambling-related expenditures

Variable	*Cognitive Therapy*	*Behaviour Therapy*	*Motivational Therapy*	*Minimal Intervention*	*Total*
% Days Gambling					
Baseline	47.2 (31.4)	46.2 (33.9)	38.8 (26.6)	36.7 (28.0)	42.0 (29.9)
End of treatment	20.1 (26.2)	22.3 (30.1)	17.9 (24.8)	19.8 (24.8)	20.2 (26.2)
3-month follow-up	19.3 (27.9)	21.7 (23.2)	23.3 (29.3)	17.6 (20.9)	20.3 (24.4)
12-month follow-up	25.3 (30.4)	19.8 (22.1)	23.3 (32.8)	23.5 (28.8)	23.0 (28.2)
% Abstinent					
Baseline	4.0	4.3	4.5	0	3.1
End of treatment	31.8	41.7	50.0	29.6	37.4
3-month follow-up	25.0	18.2	11.8	26.9	21.2
12-month follow-up	16.7	17.6	13.3	22.7	18.1
% Daily Gambling					
Baseline	16.0	17.4	0	7.1	10.2
End of treatment	4.5	4.2	0	3.7	3.3
3-month follow-up	5.0	4.5	5.9	0	3.5
12-month follow-up	5.6	0	13.3	4.5	5.6
M (SD) $ Wagered Per Gambling Day					
Baseline	196 (288)	155 (208)	816 (2271)	535 (1117)	426 (1238)
End of treatment	46 (68)	129 (251)	161 (585)	139 (244)	118 (318)
3-month follow-up	111 (238)	194 (260)	343 (863)	112 (220)	180 (442)
12-month follow-up	120 (373)	192 (341)	167 (242)	151 (248)	156 (300)
% of Sample with >$200 Gambling Expenditures					
Baseline	28.6	21.1	47.1	41.7	34.6
3-month follow-up	11.1	40.0	25.0	13.0	22.1
12-month follow-up	5.9	26.7	35.7	28.6	23.9
% of Sample with $0 Gambling Expenditures					
Baseline	4.8	5.3	5.9	0	3.7
3-month follow-up	27.8	20.0	12.5	34.8	24.7
12-month follow-up	17.6	26.7	21.4	23.8	22.4

Gambling Expenditures per Gambling Episode

An ANCOVA on gambling expenditures in the month prior to end-of-treatment, the three-month follow-up, and at the 12-month follow-up, controlling for baseline gambling wagers, revealed no significant GROUP differences at either time point ($F_{(3,79)} = 0.52$, *ns*; $F_{(3,72)} = 2.53$, *ns*; $F_{(3,59)} = 0.87$, *ns*, respectively). When the covariance analysis also included the number of treatment sessions attended, identical results were obtained ($F_{(3,78)} = 0.52$, *ns*; $F_{(3,71)} = 1.43$, *ns*; $F_{(3,58)} = 0.88$, *ns*, respectively).

A 4 (GROUP) X 3 (TIME) repeated measures analysis of variance of gambling expenditures revealed consistent findings with those described above (see Table 12), with a significant TIME effect but neither a significant GROUP nor GROUP X TIME effect. Clearly, none of the treatments delivered in this study had a differential impact on gambling-related wagering.

Table 12. Repeated measures analysis of the key dependent variables

Effect	Group				Time				Group X Time			
Variable	**F**	**df**	***p***	**eta^2**	**F**	**df**	***p***	**eta^2**	**F**	**df**	***p***	**eta^2**
Gambling frequency	0.4	3,57	ns	.02	20.4	3,171	.001	.27	1.3	9,171	ns	.07
Gambling wagers	1.1	3,44	ns	.07	5.1	2,88	.005	.10	1.6	6,88	ns	.10
DSM-IV*	0.7	3,55	ns	.03	51.4	2,110	.001	.48	0.6	6,110	ns	.03
GCQ*	0.6	3,38	ns	.05	5.1	2,76	.009	.12	1.4	6,76	ns	.10

* DSM-IV criteria for pathological gambling; GCQ; BSI.

Due to the considerable variability, the expenditure data was categorized into four levels: $0, $1 to $49, $50 to $199, and $200+, in expenditures per gambling episode. Table 11 displays the proportion of individuals in each group who reported gambling-related expenditures in excess of $200, as well as those who reported $0 per gambling episode. The table shows that the proportion of subjects who report $0 expenditures increase between baseline and three-month follow-up; there is some regression at the 12-month follow-up for some groups (i.e., cognitive therapy, minimal intervention) while other groups continue to improve somewhat (i.e., behaviour therapy, motivational therapy). Overall the gains made by the three-month follow-up were retained at 12-months.

With respect to the proportion of the sample reporting $200 or greater in gambling expenditures per gambling episode, the greatest reduction at 12-months post-treatment was observed for the cognitive therapy group (i.e., 5.9% of sample), whereas the other three groups reported substantially higher rates of excessive expenditures. However, there were no significant associations between GROUP and expenditure categories at any assessment point.

As mentioned previously, in addition to the above two categories of expenditures (i.e., $0, $200+), the sample was further categorized into those spending between $1 and $49 and those spending between $50 and $199 per gambling episode. The proportion of subjects in these categories at baseline was significantly associated with the proportions reported at the three-month follow-up, $\chi2$ (9) = 26.5, $p < .005$, and at the 12-month follow-up, $\chi2$ (9) = 20.6, $p < .05$.

At the three-month follow-up, a shift was observed in the percent reporting $0 expenditures (3.2%, compared to 22.2% at baseline) and $200+ expenditures (22.2%, compared to 33.3% at baseline) per gambling episode. At the 12-month follow-up, a shift was observed in the percent reporting $0 expenditures (3.8%, compared to 20.8% at baseline), between $1 to $49 expenditures (32.1%, compared to 41.5% at baseline), between $50 to $199 expenditures (30.2%, compared to 15.1% at baseline) and $200+ expenditures (22.6%, compared to 34.0% at baseline) per gambling episode.

Predictors of Gambling Frequency at 12-Month Follow-Up

A regression analysis was conducted to evaluate predictors of gambling frequency and gambling expenditures at the 12-month follow-up. Potential predictor variables included in the regression analysis included measures of cognitive distortion (GCQ total score), emotional dysfunction (BSI total score), high-risk situations (IGS total score), baseline gambling frequency, baseline gambling expenditures per gambling episode, number of treatment sessions attended, gambling severity (DSM-IV total score), number of pathological gambling behaviours, gambling urges, and ability to control gambling.

Three variables were retained in the final regression equation predicting frequency at 12-months: *treatment sessions attended* (*Beta* = -.39; t = -2.92, p <. 01), *baseline gambling expenditures per gambling episode* (*Beta* = .27; t = 2.21, p <. 05), and *baseline gambling frequency* (*Beta* = .51; t =

4.00, $p < .0001$). Together these three variables accounted for 28.8% of the variance in the follow-up gambling frequency. Based on the zero-order correlation between these three predictors and the criterion variable (sessions, r =.-.21; baseline expenditures, r = .15; baseline frequency, r = .45), the greater the frequency of problematic gambling at pre-treatment and related expenditures, and the more treatment sessions attended, the lower the frequency of gambling at the three-month follow-up.

In a second regression analysis predicting gambling expenditures per gambling episode in the month prior to the 12-month follow-up, and using the identical set of predictors as used in the first regression analysis, three predictors were retained in the final regression equation. Together, *baseline gambling expenditures* (*Beta* = .58; t = 4.95, p <. 0001), *baseline cognitive distortions* (*Beta* = -.49; t = -3.16, p <. 005) and *baseline frequency of high-risk situations* (*Beta* = .39; t = 1.97, p <. 05) accounted for 34.7% of the variance in gambling expenditures per gambling episode at the 12-month follow-up. As shown by the correlations between the three significant predictors and gambling expenditures per gambling episode (r = .53; r = -.13; r = .12, respectively), follow-up expenditures were positively correlated with baseline expenditures and frequency of high-risk situations, but were negatively correlated with frequency of cognitive distortions (i.e., the more cognitive distortions, the fewer gambling expenditures).

Ratings of Confidence in Ability to Control Gambling

An ANCOVA on the participants' reported confidence in their ability to control their gambling behaviour in the near future at the 12-month follow-up (controlling for baseline control ratings), revealed no significant GROUP differences ($F_{(3, 57)} = 0.33$, *ns*). Controlling for number of treatment sessions attended did not alter this result.

Paired within-subjects sample t-tests showed a significant increase across groups in the ratings of confidence to control gambling between baseline and the 12-month follow-up (M (SD) = 35.7 (24.1) percent vs. M (SD) = 68.0 (27.3) percent, t (61) = -7.61, $p < .0001$). Confidence in controlling their gambling was enhanced as a result of treatment and might be considered a predictor of future gambling behaviour.

Table 13: Ratings of confidence to control gambling, urges to gamble, and desire to gamble

Rating of:	***Cognitive Therapy***	***Behaviour Therapy***	***Motivational Therapy***	***Minimal Intervention***	***Total***
Confidence in controlling gambling					
Baseline	27.7 (21.3)	26.3 (28.3)	33.8 (20.7)	47.2 (22.3)	35.4 (24.2)
End-of-Treatment	69.9 (25.8)	75.8 (27.1)	69.0 (28.3)	75.0 (22.1)	72.7 (25.3)
3 Month Follow-Up	72.2 (22.9)	74.5 (27.0)	73.6 (26.9)	79.3 (20.2)	75.3 (23.8)
12 Month Follow-Up	66.9 (30.0)	63.5 (30.7)	66.1 (25.2)	72.7 (30.3)	67.8 (29.0)
Desire to gamble					
Baseline	81.0 (20.5)	70.3 (29.1)	83.2 (18.1)	68.4 (22.6)	75.2 (23.1)
End-of-Treatment	49.2 (34.7)	36.0 (29.8)	49.4 (33.5)	33.0 (34.2)	40.9 (33.4)
3 Month Follow-Up	41.5 (34.2)	43.0 (32.9)	55.2 (35.2)	34.1 (30.5)	68.7 (30.5)
12 Month Follow-Up	36.4 (34.6)	35.2 (29.9)	58.0 (33.4)	37. 0 (36.4)	46.8 (34.4)
Urges to gamble					
Baseline	78.2 (24.4)	76.8 (27.7)	82.6 (21.0)	68.0 (26.1)	75.4 (25.2)
End-of-Treatment	39.3 (32.2)	32.4 (30.0)	44.1 (32.0)	31.9 (35.9)	36.3 (32.6)
3 Month Follow-Up	40.0 (37.2)	35.3 (32.1)	52.9 (34.9)	29.3 (30.6)	38.1 (34.0)
12 Month Follow-Up	37.2 (35.6)	30.5 (27.0)	62.7 (31.7)	31.5 (31.8)	39.1 (33.4)
Effect of Treatment on Gambling					
End-of-Treatment	59.0 (31.9)	63.3 (31.1)	49.4 (28.2)	62.6 (25.0)	59.1 (28.9)
Importance of Addressing Gambling Relative to other Goals					

Rating of:	Cognitive Therapy	Behaviour Therapy	Motivational Therapy	Minimal Intervention	Total
Baseline	80.0 (23.0)	81.9 (20.4)	84.3 (15.6)	81.8 (22.3)	82.0 (20.4)
3 Month Follow-Up	82.6 (30.1)	77.3 (28.5)	62.7 (31.0)	80.2 (23.6)	76.5 (28.4)
12 Month Follow-Up	70.9 (27.3)	74.5 (26.5)	66.0 (30.9)	78.3 (28.5)	73.2 (28.1)

Ratings of Gambling Urges

An ANCOVA on the rating of gambling urges at the 12-month follow-up (controlling for baseline urge ratings), revealed no significant GROUP differences ($F_{(3, 56)} = 0.22$, *ns*). Controlling for number of treatment sessions attended did not alter this result (see Table 13).

Paired within-subjects sample t-tests showed a significant increase in gambling urge ratings between baseline and 12-month follow-up (M (SD) = 39.3 (32.5) percent vs. M (SD) = 72.0 (27.1) percent, $t(60) = 6.86$, $p < .0001$). The reduction of urges as a result of treatment, in general, is a positive and indirect indicator of treatment effectiveness, and may reflect a resolution of the ambivalence about gambling.

Ratings of Desire to Gamble

An ANCOVA on the rating of the desire to gamble at the 12-month follow-up (controlling for baseline desire ratings), revealed no significant GROUP differences ($F_{(3, 57)} = 0.60$, *ns*). Controlling for number of treatment sessions attended did not alter this result.

Paired within-subjects sample t-tests showed a significant decrease in desire to gamble ratings between baseline and 12-month follow-up (M (SD) = 73.7 (23.9) percent vs. M (SD) = 41.4 (33.6) percent, $t(60) = 6.49$, $p < .0001$). Thus, a significant reduction in the desire to gamble resulted from the brief treatment provided, although there were no differences between groups.

Ratings of Importance of Treatment to Gambling Improvement

An ANCOVA on the rating of importance of changing their gambling behaviour (compared to other goals important to the client) at the 12-month follow-up (controlling for baseline importance ratings), revealed no significant GROUP differences ($F_{(3, 57)} = 1.40$, *ns*). Controlling for number of treatment sessions attended did not alter this result.

Paired within-subjects sample t-tests showed no significant difference in the rated importance of changing gambling behaviour between baseline and 12-month follow-up (M (SD) = 80.6 (21.0) percent vs. M (SD) = 73.8 (27.5) percent, $t(61) = 1.80$, $p < .08$). Throughout treatment and the follow-up period thereafter, the modification of gambling behaviour remained an important goal (compared to other goals) for this sample.

Correlation of Number of Sessions Attended and Key Outcome Variables

Number of treatment sessions attended correlated significantly with very few outcome-related variables (e.g., frequency, expenditures, urges, desire, and severity). The only significant (alpha set at .01) relationship that was found occurred between frequency of treatment sessions and the baseline rating of confidence in the ability to control gambling ($r = -.32$, $p < .005$). This indicates that individuals who rated their confidence in controlling their gambling as high at baseline attended fewer sessions. Beyond this relationship, treatment attendance appears to be independent of most indicators of treatment outcome.

Treatment Evaluation

At the end of treatment, clients were asked to evaluate the treatment they had received. Table 13 summarizes these results. No GROUP differences emerged. The program as a whole, length, content,

and helpfulness was assigned a moderately positive evaluation and suggests that the treatments delivered can be improved.

Table 14: Evaluation of treatment

Rating (%):	*Cognitive Therapy*	*Behaviour Therapy*	*Motivational Therapy*	*Minimal Intervention*	*Total*
Satisfaction with Program as a Whole	66.1	65.0	58.0	74.8	66.9
Satisfaction with Length of Program	58.0	63.2	55.4	71.8	63.1
Satisfaction with Treatment Received	65.0	75.6	60.1	78.3	70.8
Program Helpful in Reducing	63.1	62.1	52.3	69.1	62.5

Discussion

The initial intent of this study was to evaluate the efficacy of cognitive therapy, while controlling for several additional interventions that often "contaminated" the delivery of cognitive interventions (e.g., behavioural, motivational strategies). While it is impossible to deliver pure forms of any therapy without including elements of other modalities, it is possible to develop treatments that are essentially cognitive, behavioural, or motivational, and which minimize the role of alternative interventions. This was the approach taken in this study, where the cognitive, behavioural, and motivational treatments each stressed modification of gambling thoughts, action-oriented strategies, and awareness of key values threatened by gambling, respectively, but avoided the discussion of alternative approaches or modalities as much as was clinically possible. In this way, the relative efficacy of these differing modalities could be examined in a controlled fashion.

A sample of problem gamblers, the majority of whom met DSM-IV criteria for pathological gambling, were recruited from the community and randomly assigned to one of four brief treatments: six sessions of either cognitive, behavioural, and motivational treatment, or one session comprised of elements of all three treatments. The randomization procedure was successful as very few pre-treatment differences were found.

A sample of 99 subjects was randomized into the four brief treatments. Follow-up assessments took place at three and 12 months post-treatment. The sample was generally found to be male, middle-aged, under-employed and un-partnered. They scored in the moderately severe range of gambling pathology. About half of the sample had previous contact with the addiction or psychiatric treatment system. Multiple gambling problems were common, but problems were often reported for casino games, slot machines, and race-track betting.

Three hypotheses were evaluated. The first hypothesis stated that there would be no group differences on gambling frequency and wagering at the end-of-treatment. This hypothesis was based on the assumption that all subjects interested in seeking treatment would initially be motivated to do well and would respond to any genuine intervention. This hypothesis was supported as no group differences were found. Indeed, the sample as a whole improved between the beginning and end of treatment, regardless of the number of sessions attended and whether or not treatment was actually completed.

The second hypothesis stated that group CT would be superior to the other three groups at the three-month follow-up on key gambling measures. This hypothesis was not supported, as no group differences were found. In general, the gains made at the end-of-treatment were maintained at the

three-month follow-up for the sample as a whole, although there was some regression on measures of gambling behaviour (i.e., frequency, expenditures).

The third hypothesis stated that group CT would be superior to the three other groups on key gambling measures at the 12-month follow-up. This hypothesis was also not supported, as the groups did not differ at any point in the post-treatment period, and generally maintained the changes reported at the three-month follow-up.

Similar results were found for other gambling-relevant measures. While there were no significant group differences, the sample as a whole improved on measures of cognitive distortions, emotional dysfunction, diagnostic severity, ratings of gambling urges, confidence in controlling gambling, and desire to gamble, as a result of treatment.

Unfortunately, at the end of the one-year follow-up, about one-quarter of the sample continued to meet criteria for DSM-IV pathological gambling. As discussed in the results section, the follow-up DSM-IV score may not accurately reflect the client's status at the end of the follow-up period, as the diagnostic criteria ask the individual to take into account the previous year in deciding whether the symptom is present. Thus, it is possible that restricting the time frame to the latter few months may have yielded more positive outcomes.

Nevertheless, substantial proportions of the sample continued to expend relatively large amounts when gambling (i.e., > $200) and to not adopt an abstinent goal. While about a third of the sample reported being abstinent at the end of-treatment, this had decreased to just below 20% at the 12-month follow-up. Considering that the rates of daily gambling had not shown a substantial change, the subjects may have retreated from a position of complete avoidance of the gambling activity, and were still involved in some form of gambling. However, this shift may be indicative of a developing relapse process. Further, brief treatments, even if effective in bringing about significant change, may benefit from booster sessions to maintain such change and prevent regression or relapse.

The less than ideal outcomes reported in this study may reflect the effort to maintain the internal validity of the study; that is, therapists did not deviate from providing the treatment that a subject was randomized to despite the fact that they may have benefited from other interventions. In the “real world” of community-based treatment, interventions would be matched and individualized to the client's needs. As a result, clinical outcomes might be expected to be less than optimal. This adherence to the methodological rigor strengthens the conclusion that the treatments are generally equivocal.

The regression analyses predicting frequency suggest that baseline gambling behaviour is important to consider in predicting outcome. The more a client is gambling when they begin treatment, the more likely they will be gambling when they complete treatment. This is consistent with the often-noted link between severity of psychopathology and clinical outcomes. In addition, treatment attendance was correlated with lower gambling frequencies, suggesting that clients should be encouraged to complete as much treatment as possible. The regression analysis predicting gambling expenditures was more difficult to interpret. These results suggest that baseline expenditures were important in predicting this variable, as well as frequency of high-risk situations. Counter-intuitively, more frequent cognitive distortions appeared to be inversely correlated with gambling expenditures.

It is clear that the groups in this study were equivalent in efficacy. This is not surprising as they are all characterized by practical, problem-solving approaches to habit change consistent with reviews by Shaffer and Korn (2004) and Toneatto and Ladouceur (2003). The results of this study are also consistent with the psychotherapy outcome literature by finding little difference between treatments when evaluated in an empirically rigorous fashion. It may not be useful to consider behavioural, cognitive, and motivational symptoms of gambling as separate, non-interacting systems that can be targeted independently of each other. Rather, these symptom clusters may be better viewed as unique expressions of a gambling syndrome, each of which can influence the other symptom clusters and act as potential entry points to the modification of the entire syndrome. Thus, it would not be surprising to observe that such treatments would all be relatively effective in reducing gambling behaviour (and

related phenomena such as urges and desires). For example, this study shows that while a "pure" cognitive approach can modify behaviour, a one-session intervention can strongly modify cognitive distortions.

There appears to be no justification, based on the results of this study, to conclude that any one of the treatments tested in this research is superior to any other. They all share a common approach of assisting an individual with a gambling problem in a practical, problem/solution-focused manner, resembling how humans generally solve any problem they might encounter in life.

Of considerable interest is the finding that participants in the MI group did as well as those who completed one of the six-session treatments. This suggests that the clinical gains observed in this study may be more reflective of non-specific factors rather than treatment, per se. These factors could include motivation, fear, lack of financial resources, and so on. Shaffer and Korn (2004) summarize other research attesting to the profound influence of non-specific factors, such as social support, education, hope, and expectancies, as well as the intra-therapeutic factors of empathy, compassion, and warmth. In addition, it is quite possible that self-healing factors are also at work. Thus, it is feasible that gamblers respond to and require very brief interventions that may serve primarily as professional support for their own efforts to change, rather than providing a specific therapeutic curative factor.

The results of the MI group also suggest that the key ingredients of treatment can be delivered within a very brief period, beyond which the impacts of professional interventions diminish. The readiness to change, which may be present at the beginning of treatment, is an opportunity to trigger the change process, which might be more difficult to do in subsequent weeks as the reasons for seeking treatment begin to fade, or as other factors serve to attenuate the negative consequences of gambling. Building upon the results of the MI group and determining ways of strengthening it (e.g., booster sessions, audio taped sessions, self-helps materials) may be the most cost-effective way to proceed in developing effective treatment for pathological gambling.

It should be noted that the key outcome variables measured in this study are related to the psychopathology of gambling (i.e., frequency of gambling, distortions, and emotional symptoms). The finding that clients have improved as a result of treatment is not surprising but cannot be interpreted as necessarily increasing the quality of life or life satisfaction. For clients whose gambling has led to long-term financial difficulties or who have jeopardized significant interpersonal relationships, the consequences of their gambling may require considerable time and effort to fully resolve and heal. Unfortunately, an overall measure of quality of life was not included to ascertain the degree that the participants also experienced an increase in their overall state of well-being.

Providing treatment-seeking problem gamblers with useful self-management strategies, irrespective of theoretical modality, may be the most effective way to assist this clinical population. Such interventions can be administered in a brief fashion (e.g., between one and six sessions) and booster sessions offered to those who require additional assistance (and to maintain the gains in the long-term). Since a sizeable minority of the sample continued to exhibit clinically significant gambling symptoms, it is necessary to determine which sub-population of problem gamblers responds best to such brief treatments.

Limitations of the Research

Weaknesses of this research include lack of objective measures of treatment fidelity, unequal sample sizes, therapists with varying clinical expertise and experience, and moderate follow-up success. In addition, the lack of a no-treatment group cannot address the question of whether these four groups were better than no treatment at all. Nevertheless, this study supports the growing awareness of the equivocal nature of brief, practical, problem-solving therapies such as the cognitive and behavioural treatments commonly employed in the treatment of addictions.

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