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The Efficacy of Individual Community Reinforcement and Family Training (CRAFT) for Concerned Significant Others of Problem Gamblers

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Abstract

Treatment options for concerned significant others (CSOs) of problem gamblers are limited, and available treatments focus exclusively on the distress of CSOs. Community Reinforcement and Family Training (CRAFT) is a comprehensive treatment program for CSOs of substance abusers that has been shown to reduce CSO distress in addition to the substance abuser's alcohol or drug behaviour. CRAFT capitalizes on the well-documented fact that family members have considerable influence on the substance abuser's decision to enter treatment. The present study modified the CRAFT approach into an individual treatment format for CSOs of problem gamblers and examined its efficacy in comparison to a CRAFT self-help workbook in a randomized clinical trial. A total of 31 participants were recruited. No statistical differences were found between the groups; however, effect sizes indicated that participants who received the CRAFT individual intervention seemed to have better outcomes than did those who received the CRAFT workbook (decreased days and dollars gambled by the gambler and improved CSO functioning). No differences between groups were found for gambler treatment entry rates over the follow-up period in terms of effect sizes. The results provide initial, but limited, support for the CRAFT approach delivered to CSOs of treatment-resistant problem gamblers in an individual treatment format compared with the self-help workbook format. Further research with larger sample sizes is needed to gauge the efficacy of the CRAFT individual intervention compared with the CRAFT self-help workbook.

Keywords: problem gambling, disordered gambling, significant other, treatment, CRAFT

Résumé

Les options de thérapie offertes aux proches concernés (PC) d'une personne ayant un problème de jeu sont peu nombreuses et concernent exclusivement la détresse qu'ils éprouvent. L'approche Community Reinforcement and Family Training (CRAFT)

est un programme de traitement complet et éprouvé destiné aux PC d'une personne ayant un problème d'alcool ou de drogue qui permet d'atténuer la détresse des PC tout en diminuant les comportements de consommation de la personne souffrant d'une dépendance à l'alcool ou à la drogue. L'approche CRAFT mise sur le fait bien documenté que les membres de la famille exercent une influence considérable sur la décision d'une personne aux prises avec un problème de drogue ou d'alcool d'entreprendre une thérapie. Dans le cadre de la présente étude, l'approche CRAFT a d'abord été modifiée de manière à en tirer un format individuel de thérapie pour les PC d'une personne ayant un problème de jeu, puis au moyen d'un essai clinique randomisé l'efficacité de ce format individuel a été comparée à celle d'un manuel de traitement autonome reposant aussi sur l'approche CRAFT. Au total, 31 participants ont été recrutés pour l'étude. Aucune différence statistique n'a été observée entre les groupes, bien que l'ampleur de l'effet indique que la thérapie semble avoir donné de meilleurs résultats chez les participants ayant reçu une intervention individuelle que chez ceux qui ont reçu le manuel de traitement autonome (diminution de la fréquence en jour des comportements associés au jeu de la personne ayant un problème de jeu et des sommes dépensées par celle-ci, et amélioration de la capacité à fonctionner des PC). Aucune différence entre les groupes n'a été constatée quant au taux de joueurs ayant entrepris une thérapie durant la période de suivi. Ainsi, bien qu'ils soient limités, les résultats de l'étude tendent à démontrer que l'approche CRAFT est plus efficace pour traiter les CP d'une personne ayant un problème de jeu réfractaire au traitement lorsqu'elle prend la forme d'une thérapie individuelle que la forme d'un manuel de traitement autonome. De plus amples recherches portant sur des échantillons plus importants sont cependant nécessaires afin de mieux évaluer l'efficacité d'une intervention individuelle par rapport à un manuel de traitement autonome en ce qui a trait à l'approche CRAFT.

Introduction

Gambling disorder, classified as an addictive disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association [APA], 2013), is defined as “persistent and recurrent maladaptive gambling behaviour that disrupts personal, family or vocational pursuits” (p. 585). The negative consequences incurred from gambling are estimated to affect eight to 10 individuals in the gambler's life (Lobsinger & Beckett, 1996) and have been reported to affect as many as 15 (Lesieur & Custer, 1984). Concerned significant others (CSOs) of problem gamblers typically include individuals who are close to the problem gambler, such as spouses, common-law partners, children, parents, and siblings. The behaviour of problem gamblers can have a severe impact on all aspects of CSOs' lives, including financial and legal problems, personal distress, and

relationship difficulties (Abbott, Cramer, & Sherrets, 1995; McComb, Lee, & Sprenkle, 2009; Petry, 2005; Shaw, Forbush, Schlinder, Rosenman, & Black, 2007).

CSOs of problem gamblers have not received the research or clinical attention that is warranted, given the distress they experience and their important role in recovery. Family influence is often cited by problem gamblers as an important factor in the ultimate decision to quit or reduce gambling behaviour, as well as to maintain abstinence (Hodgins & el-Guebaly, 2004; Hodgins, Makarchuk, el-Guebaly, & Peden, 2002). Conversely, many CSOs of problem gamblers may unintentionally contribute to the gambling problem, typically through enabling behaviours (e.g., they may join the gambler in gambling activities or provide financial bailouts). Relationship problems have also been cited by problem gamblers as a main reason contributing to relapse (Hodgins et al., 2002).

Another benefit of engaging CSOs in treatment is to access those problem gamblers who are resistant to seeking treatment to possibly influence their recovery initiatives. It has been determined that almost 97% of problem gamblers have never sought formal treatment for their gambling problems (Cunningham, 2005; National Gambling Impact Study Commission, 1999). Moreover, Volberg (1998) and others (e.g., Rush, Moxam, & Urbanoski, 2002) have determined that the majority of problem gamblers are not using treatment services, which leaves the CSOs to face the consequences of the problem gambling behaviour unassisted.

Treatment options for CSOs of problem gamblers are limited. In Calgary, Alberta, options include the following three alternatives: (1) a 12-step Gam-Anon group that meets once a week; (2) a 4-week therapist-directed counselling group intended for CSOs of individuals experiencing problems with alcohol, drugs, or gambling; or (3) a self-help workbook based on the Community Reinforcement and Family Training (CRAFT) approach (Makarchuk & Hodgins, 2001). There is also opportunity for some individuals to seek individual counselling through venues such as their Employee Assistance Program. Of these options, only the self-help workbook has been examined empirically.

The self-help workbook (Makarchuk & Hodgins, 2001) is based on CRAFT, an intervention first developed for use with CSOs of treatment-resistant alcoholics (Sisson & Azrin, 1986). The original approach was implemented as a face-to-face intervention delivered in approximately eight sessions. The principles of CRAFT are derived from the Community Reinforcement Approach, which espouses elements of the family system perspective and is grounded in Skinner's behaviour theory (Azrin, 1976). The developers of CRAFT assert that its unique components are the inclusion of the functional analyses of behaviours, the use of positive reinforcers and time outs from positive reinforcers, and the emphasis on the CSO's personal well-being (Smith & Meyers, 2004). The CSOs of problem gamblers learn behavioural skills of reinforcing gambling-free behaviours and withholding reinforcement for gambling behaviours. Avoiding negative reinforcement is also encouraged. For example, family members often enable the gambling behaviour by removing natural consequences that may

act as deterrents to gambling (e.g., paying bills for gamblers). CSOs are taught to let natural consequences occur and how to influence environmental contingencies in order to provide reinforcement for decreased gambling and to withhold reinforcement for gambling. The CRAFT intervention also includes motivational techniques, communication training, and domestic violence precautions (Smith & Meyers, 2004).

CRAFT was revised into a self-help format for CSOs of problem gamblers, which was successfully pilot tested (Makarchuk, Hodgins & Peden, 2002) and also used in a large randomized controlled trial (Hodgins, Toneatto, Makarchuk, Skinner & Vincent, 2007). In both studies, the CSOs who received the CRAFT materials fared better than did the CSOs in the control group, reporting decreased gambling by the problem gambler and more satisfaction with the intervention. However, the groups were equivalent for CSO emotional functioning and relationship functioning, as well as for treatment engagement rates of gamblers. An important finding was that many CSOs reported the need for more support in implementing the strategies and procedures, and the authors concluded that CRAFT delivered in its original format (i.e., individual face-to-face) may increase the efficacy of this approach (Hodgins, Toneatto, et al., 2007).

Given that CRAFT has demonstrated some positive results in a self-help format, we adapted this approach for use with CSOs of problem gamblers in an individual format. We modified the original CRAFT protocol for CSOs of substance abusers for use with CSOs of problem gamblers and tested it in a randomized clinical trial. The primary hypotheses were as follows: (1) Participants who received the CRAFT individual intervention would report higher rates of gambler treatment entry than would participants in the workbook group; (2) participants who received the CRAFT individual intervention would report less gambling by the gambler than would participants in the workbook group; and (3a) participants who received the CRAFT individual intervention would report lower levels of personal distress and (3b) better relationship functioning with the gambler than would participants in the workbook group.

Method

Procedure

This study received ethics approval from the Conjoint Faculties Research Ethics Board. The initial step in this study involved the development of the therapist treatment manual and client handouts, which were designed specifically for use with CSOs of problem gamblers. The CRAFT approach for CSOs of problem gamblers was developed by closely following the original CRAFT protocol for CSOs of substance users (Smith & Meyers, 2004) and included information from the materials that were developed for the self-help workbook for CSOs of problem gamblers (Makarchuk & Hodgins, 2001). After the therapist treatment manual was developed, a treatment integrity checklist for evaluating therapist adherence to the CRAFT protocol was created. Each therapist completed a 6-hour training session on the

CRAFT approach for CSOs of problem gamblers, including a detailed review of the problem gambling therapist manual. Supervision for the CRAFT intervention was provided on a weekly basis by a cognitive-behavioural clinical psychologist, who reviewed tape-recorded sessions and provided feedback. Therapists met biweekly to discuss client cases and brainstorm ideas of how best to implement procedures.

Participants were screened over the telephone to meet the following inclusion criteria: the CSO and the gambler must be 18 years or older; the CSO has a minimum of 3 days a week of contact with the gambler; the CSO is a close relative or partner of the gambler; the gambler is resistant to the suggestion for treatment; the gambler meets the criteria for problem gambling, as reported by the CSO, on the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; APA, 2000) diagnostic criteria for pathological gambling; the CSO reads at a minimum sixth-grade reading level (self-reported); the CSO completes the initial face-to-face and follow-up interviews via the telephone; and the CSO provides the name of a close relative or friend to help locate CSO for post-assessment interviews. Gamblers or CSOs that attended treatment for gambling-related problems in the 2 months prior to screening were excluded.

Participants

Thirty-one CSOs of problem gamblers were recruited over a 17-month period through press releases; paid and unpaid media advertisements (including online sites); local counselling services (including the provincial gambling helpline, pamphlets, and posters); other referral agencies (e.g., Employee Assistance Program therapists); and pamphlets or posters posted in community centres, bars, supermarkets, legions, and churches.

An urn randomization computer program (http://www.commed.uchc.edu/programs/health_services/match/urn/index.html) was used to ensure that an equal number of participants was assigned to each group (individual intervention or the workbook) while stratifying the sample on three variables: gender, relationship to gambler (spouse/non-spouse), and severity of gambling problem (categorized as “high” if number of *DSM-IV-TR* criteria for pathological gambling met was seven or greater and “low” if six or lower).

Self-help workbook group. Participants in this group received the CRAFT self-help workbook (Makarchuk & Hodgins, 2001) following the initial interview. The research assistant provided a brief history on the success of the self-help workbook, and participants were instructed to read through the workbook and complete the exercises on a weekly basis.

Individual intervention group. A research assistant provided participants with the same brief history on the success of the self-help workbook for problem gamblers and they were informed that a therapist would help them work through exercises in individual sessions. Participants in the individual intervention group participated in

eight to twelve 1-hour sessions in which the CRAFT approach was delivered by one of four Masters-level therapists.

Follow-up Interviews

The 3-month and 6-month follow-up interviews were conducted over the telephone by a research assistant who was blind to the treatment condition. A second researcher compiled the follow-up package, which was organized to ensure that the treatment condition was revealed at the end of the interview and the appropriate measures were given.

Measures

Screening.

Concerned Significant Others of Gamblers DSM-IV Screening Questionnaire (Makarchuk et al., 2002). Diagnostically, the number of *DSM-IV* (APA, 1994) symptoms exhibited by the gambler, as reported by the CSO, was calculated by using the Concerned Significant Others of Gamblers DSM-IV Screening Questionnaire. This questionnaire was used at screening to ensure that the gambler was experiencing gambling problems to a significant degree, as reported by the CSO. A significant degree of gambling problems was defined as 4 or more on this scale, indicating that “probable pathological gambling” is likely.

Gambling behaviours and consequences.

Timeline Followback (Sobell & Sobell, 1992). The Timeline Followback method was first developed as an instrument to aid retrospective recall of alcohol consumption and has been modified for use with problem gamblers (Hodgins & Makarchuk, 2003; Weinstock, Whelan, & Meyers, 2004). Examination of CSO and gambler reports of gambling information demonstrates agreement in the “fair” to “good” range (Hodgins & Makarchuk, 2003). Research assistants used this method to aid the CSO in reconstructing the gambling behaviour (frequency in days gambled and dollar amount spent for each type of problem gambling) in the 2 months prior to the initial assessment. Participants provided a rating of how confident they were in the accuracy of gambling information that they reported (not at all, slightly, moderately, extremely). Past treatment involvement of the gambler and treatment sought over the follow-up period was recorded, including type (self-help, informal, and formal treatments) and frequency of treatment.

CSO psychological functioning.

Brief Symptom Inventory (BSI; Derogatis, 1993). The BSI is a 53-item self-report questionnaire that reflects psychological symptoms experienced in the past week. The items are rated on a 5-point Likert scale and yield a Global Severity Index that reflects a general level of distress and has shown excellent test-retest reliability across time. This measure is sensitive to change and has good internal consistency (alpha coefficients ranging from .71 to .85).

Relationship functioning.

Relationship Happiness Scale (RHS; Azrin, Naster, & Jones, 1973). RHS was used to assess current relationship happiness between the gambler and the CSO. Areas of interaction are rated on a scale from 1 (*completely unhappy*) to 10 (*completely happy*). A study of CSOs of problem gamblers reported high retest reliability (intraclass correlation coefficient [ICC] = .77) and demonstrated sensitivity to change (Hodgins, Shead, & Makarchuk, 2007).

Relationship Assessment Scale (RAS; Hendrick, 1988). Four items from the seven-item RAS were used; the three items not included pertained to romantic relationships only. Concurrent validity, predictive validity, and internal consistency are all well established for this instrument. The coefficient alpha for these four questions in a sample of CSOs of problem gamblers was found to be .85 and retest reliability (ICC) to be .86 (Hodgins, Shead, & Makarchuk, 2007).

Satisfaction questions about the program. All participants were questioned regarding (1) satisfaction with the program (quite dissatisfied, indifferent or mildly satisfied, mostly satisfied, very satisfied), (2) the extent to which the program met their needs (none, only a few, most, almost all), and (3) whether they would recommend the program to a friend in need of similar help (definitely not, not really, generally, definitely).

Data Analyses

All data analyses were conducted with PASW Statistics 17 for Windows. Preliminary analysis included screening for accuracy of input, missing data, outliers, and normal distributions, which included examination of profile plots and skewness and kurtosis (Tabachnick & Fidell, 2001). The two groups were compared across all initial assessment variables by using chi-square analysis for categorical measures and *t* tests for continuous measures. The main statistical procedure for all outcome variables compared group differences over the follow-up period by using the generalized linear model with a repeated measures 2×2 analysis of covariance, with one between group factor (group = workbook vs. individual intervention) and one repeated measures factor (time = 3 months, 6 months), with the initial measure entered as a covariate.

Given the small sample size in this study and thus low power, effect sizes with confidence intervals were calculated as a gauge of clinical significance (APA, 2000; Baer & Ahern, 1993; Odgaard & Fowler, 2010; Steiger, 2004). Many researchers have used effect sizes in treatment research to help interpret the magnitude of differences between groups (e.g., Baer & Ahern, 1993, p. 356; O'Farrell, Murphy, Alter, & Fals-Stewart, 2007). Cohen (1988) suggests the following benchmarks for interpretation of effect sizes: $d = 0.8$ or higher is considered a large effect size, $d = 0.5$ is a medium effect, and $d = 0.2$ is a small, but consequential, effect. A Bonferroni correction was used for each hypothesis (i.e., $p < .05$ for Hypothesis 1; $p < .025$ for Hypothesis 2; and $p < .006$ for Hypothesis 3.)

Results

Group Comparison

The two groups were compared across all initial assessment variables. Table 1 shows that the groups did not significantly differ on any of the stratification variables used in the randomization procedure (gender, spouse/non-spouse, *DSM-IV-TR* criteria high/low) or across any of the initial assessment variables. However, several differences seem of prognostic importance, as they may not have been statistically significant because of the small sample size (Altman, 1985). BSI scores were higher in the individual intervention group than in the workbook group. Participants in the individual intervention group also seemed to be dealing with the gambling problem for a longer period (12 vs. 9 years), although this was not statistically significant.

Follow-up Rates

Figure 1 displays a CONSORT flow diagram that depicts enrolment, group allocation, follow-up rates, and total sample used in the analysis. Twenty-one participants (68%) completed all three assessment interviews. Follow-up rates did not differ significantly between the individual intervention and workbook groups for the 3-month follow-up, $\chi^2(1) = .11, p = .54$ (mean 75% vs. 80%, respectively) or the 6-month follow-up, $\chi^2(1) = .011, p = .62$ (mean = 75% vs. 73%, respectively). Overall, by the completion of the interview, the research assistants remained blind in 29% of cases at the 3-month follow-up and 60% of cases at the 6-month follow-up.

We compared the participants who completed the 3- and 6-month follow-up interviews with those who did not complete these interviews by using chi-square analysis for categorical measures and *t* tests for continuous measures. Results are presented in Table 2.

Individual Intervention Group

Treatment integrity was measured with the CRAFT adherence checklist developed for this study. For each therapist, a random group of participants was selected to assess treatment adherence to the CRAFT protocol by using the checklist. Two volunteer research assistants rated all of the individual intervention sessions conducted for seven participants. The agreement between the raters was ranked as high (ICC = .737, $p = .013$, confidence interval [.126, .948]). Therapist adherence to the CRAFT protocol was rated by both raters at an average of 89% ($SD_{\text{Rater1}} = 7.36$; $SD_{\text{Rater2}} = 4.72$; range 84%-98%), with no obvious differences among therapists.

The 16 participants completed a mean of 10.4 sessions ($SD = 2.4$, range 4-12). Despite encouragement from therapists to complete therapy, two participants dropped out of the individual intervention prior to completion because they left the relationship with the gambler (one participant completed four sessions and the other completed six sessions). Both participants provided information at the 3- and

Table 1
Comparison of Each Group for Demographics and Initial Assessment Variables

Characteristics	Individual intervention (<i>N</i> = 16)	Workbook (<i>N</i> = 15)	Statistical comparison, χ^2 or <i>t</i>
CSO characteristics			
Female, <i>n</i> (%)	14 (93%)	14 (88%)	χ^2 (1) = .301, <i>p</i> = .58
Age, mean years (<i>SD</i>)	47 (12.8)	46 (12.9)	<i>t</i> (29) = -.34, <i>p</i> = .73
Marital status, <i>n</i> (%)			χ^2 (5) = 6.44, <i>p</i> = .27
Married	8 (50%)	8 (53%)	
Common law	2 (13%)	4 (27%)	
Separated	1 (6%)	0	
Divorced	0	2 (13%)	
Never married	4 (25%)	1 (6%)	
Widowed	1 (6%)	0	
Number of children, mean (<i>SD</i>)	2.3 (1.6)	1.7 (1.4)	<i>t</i> (29) = -.95, <i>p</i> = .35
Cultural group, <i>n</i> (%)			χ^2 (4) = 5.13, <i>p</i> = .28
Canadian	14 (88%)	12 (80%)	
Italian	0	2 (13%)	
German	1 (6%)	0	
Hungarian	1 (6%)	0	
Chinese	0	1 (6%)	
Highest grade completed, mean (<i>SD</i>)	11.6 (1.0)	11.7 (1.0)	<i>t</i> (29) = .112, <i>p</i> = .91
Higher education, <i>n</i> (%)	4 (25%)	9 (60%)	χ^2 (1) = 3.89, <i>p</i> = .07
Employed (full or part-time), <i>n</i> (%)	14 (93%)	16 (100%)	χ^2 (1) = 1.10, <i>p</i> = .29
CSO relationship to gambler, <i>n</i> (%)			χ^2 (5) = .70, <i>p</i> = .95
Married spouse	7 (44%)	7 (47%)	
Common-law partner	3 (18%)	2 (13%)	
Parent	2 (13%)	2 (13%)	
Child	2 (13%)	3 (20%)	
Boy/girlfriend	1 (6%)	1 (7%)	
Separated spouse	1 (6%)	0	
History of treatment for their significant other's gambling problem, <i>n</i> (%)	2 (13%)	5 (33%)	χ^2 (1) = 1.92, <i>p</i> = .22
BSI (GSI score), mean (<i>SD</i>)	51.4 (39.1)	43.5 (24.7)	<i>t</i> (29) = -.65, <i>p</i> = .52
Relationship Happiness Scale, mean (<i>SD</i>)	4.5 (2.8)	3.9 (1.6)	<i>t</i> (29) = -.77, <i>p</i> = .45
Relationship Assessment Scale, Mean (<i>SD</i>)	9.6 (4.5)	8.5 (2.8)	<i>t</i> (29) = -.81, <i>p</i> = .42
Gambler Characteristics			
<i>DSM-IV-TR</i> criteria, mean/10 (<i>SD</i>)	8.1 (1.2)	8.0 (1.9)	<i>t</i> (29) = -.22, <i>p</i> = .82
Length of gambling problem, mean years (<i>SD</i>)	12.3 (11.7)	9.0 (7.6)	<i>t</i> (29) = -.94, <i>p</i> = .36
History of treatment for gambling problem, <i>n</i> (%)	6 (38%)	7 (47%)	χ^2 (1) = .27, <i>p</i> = .72
Days gambled in past 2 months, mean (<i>SD</i>)	10 (10.3)	8 (7.8)	<i>t</i> (29) = -.59, <i>p</i> = .55
Money gambled in past 2 months, mean (<i>SD</i>)	-\$1794 (1731)	-\$1539 (1387)	<i>t</i> (29) = .45, <i>p</i> = .66

Table 1
Continued

Characteristics	Individual intervention (<i>N</i> = 16)	Workbook (<i>N</i> = 15)	Statistical comparison, χ^2 or <i>t</i>
Type of gambling problem, <i>n</i> (%)			
VLTs/slots	15 (94%)	10 (67%)	χ^2 (1) = 3.64, <i>p</i> = .08
Casino games	6 (38%)	7 (47%)	χ^2 (1) = .27, <i>p</i> = .72
Sports betting	7 (44%)	4 (27%)	χ^2 (1) = .99, <i>p</i> = .46
Card games with friends	4 (25%)	3 (20%)	χ^2 (1) = .11, <i>p</i> = 1.0
Bingo	3 (18%)	0	χ^2 (1) = 3.11, <i>p</i> = .23
Lotto/raffle/Nevada/scratch tickets/keno	3 (18%)	5 (31%)	χ^2 (1) = .51, <i>p</i> = .69
Online gambling	1 (6%)	2 (13%)	χ^2 (1) = .44, <i>p</i> = .60

Note. CSO = concerned significant other; BSI = Brief Symptom Inventory; GST = Global Severity Index; VLTs = video lottery terminals.

6-month follow-ups about whether the gambler entered treatment and the days and dollars gambled over the follow-up period. These participants stated that they did not feel comfortable answering questions on personal or relationship functioning, as they felt it would negatively reflect on the treatment received.

Hypothesis 1: Assessment of treatment entry. We predicted that participants in the individual intervention group would have greater success in engaging the gambler in treatment than would those in the workbook group. The findings do not support the hypothesis: No gamblers entered treatment by the 3-month follow-up, and two gamblers from each group had entered treatment by the 6-month follow-up (17.4%).

Hypothesis 2: Assessment of gambling behaviour. We hypothesized that participants who received the individual intervention would report decreased gambling behaviour by their significant other, reflected by fewer days gambled and dollars gambled over the follow-up period. The analysis of days gambled and dollars gambled excludes those participants who were “not at all” confident (*n* = 5) in their reports of gambling behaviour.

For the variable days gambled, there was no significant time effect, $F(1, 14) = 1.53$, $p = .24$, power = .21; no significant group effect, $F(1, 14) = .14$, $p = .71$, power = .06; and no significant group \times time interaction found, $F(1, 14) = .09$, $p = .91$, power = .05 (means and *SDs* are displayed in Table 3). As seen in Table 3, the magnitude of the difference in days gambled between initial assessment and 6-month follow-up was considered to be small between the groups. The effect sizes over the 6-month follow-up for each group were considered to be medium for the workbook group and large for the individual intervention group.

For dollars gambled, the analysis revealed a significant time effect, $F(1, 13) = 5.35$, $p = .04$, power = .57. No group effect was found, $F(1, 13) = 1.59$, $p = .23$, power = .22,

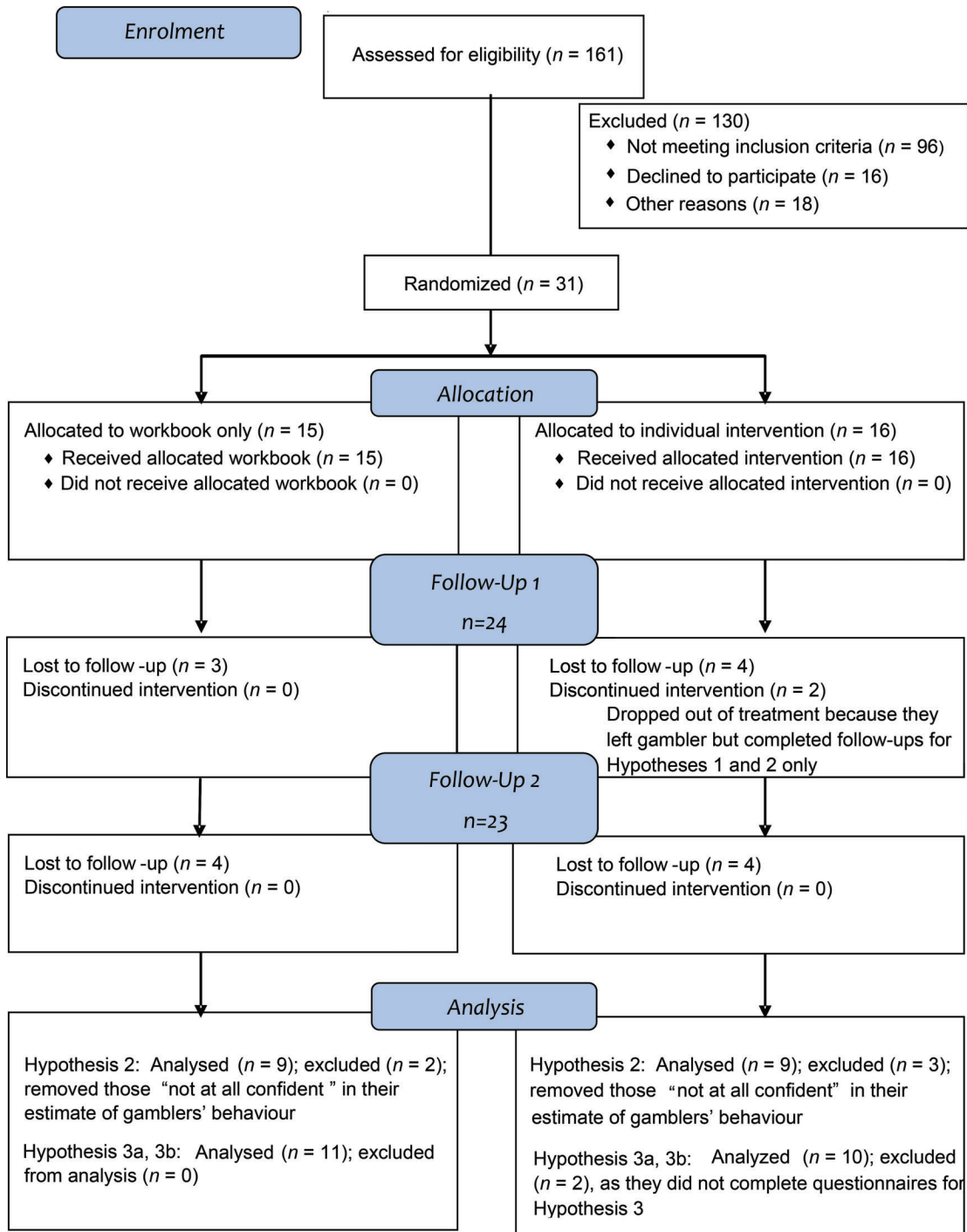


Figure 1. CONSORT flow chart.

and no group \times time interaction was found, $F(1, 13) = .01, p = .91, \text{power} = .05$. Table 3 displays the covariate-adjusted means for each period. The magnitude of the difference favouring the individual intervention over the workbook group at 6 months approached a medium effect. The magnitude of the difference between the initial

Table 2
 Comparison of CSO and Gambler Characteristics and Measured Variables for Those Who Completed Follow-up Interviews and Those Who Did Not

Characteristics	3 Months			6 Months		
	Completed follow-up interview (N = 24)	Did not complete follow-up interview (N = 7)	Statistical comparison χ^2 or t	Completed follow-up interview (N = 23)	Did not complete follow-up interview (N = 8)	Statistical comparison χ^2 or t
CSO characteristics						
Female, %	88%	100%	$\chi^2 (1) = .97, p = .45$	91%	88%	$\chi^2 (1) = .10, p = .61$
Age, mean (SD)	47 years (10.6)	44 years (18.9)	$t (29) = .65, p = .52$	46 years(11.0)	47 years (17.5)	$t (29) = .16, p = .87$
Marital status (married/common law), %	75%	57%	$\chi^2 (5) = 5.42, p = .37$	70%	75%	$\chi^2 (5) = 4.19, p = .52$
Number of children, mean (SD)	2.2 (1.5)	1.2 (1.3)	$t (29) = 1.45, p = .16$	2.0 (1.6)	1.9 (1.4)	$t (29) = .41, p = .79$
Cultural group (Canadian), %	83%	86%	$\chi^2 (4) = 4.59, p = .33$	83%	88%	$\chi^2 (4) = 4.28, p = .37$
Highest grade completed, mean (SD)	10.6 (1.86)	11.7 (.76)	$t (29) = 1.49, p = .15$	11.7 (1.02)	11.6 (1.06)	$t (29) = -.06, p = .96$
Higher education, %	46%	29%	$\chi^2 (1) = .66, p = .67$	52%	13%	$\chi^2 (1) = 3.84, p = .06$
Employed (full or part-time), %	96%	100%	$\chi^2 (1) = .30, p = 1.0$	96%	100%	$\chi^2 (1) = .36, p = .74$
CSO relationship to gambler (married/common law), %	58%	72%	$\chi^2 (4) = 1.79, p = .78$	57%	75%	$\chi^2 (4) = 7.19, p = .13$
	17%	43%	$\chi^2 (1) = 2.13, p = .17$	22%	25%	$\chi^2 (1) = .04, p = .60$

Table 2
Continued

Characteristics	3 Months			6 Months		
	Completed follow-up interview (N = 24)	Did not complete follow-up interview (N = 7)	Statistical comparison χ^2 or <i>t</i>	Completed follow-up interview (N = 23)	Did not complete follow-up interview (N = 8)	Statistical comparison, χ^2 or <i>t</i>
Prior treatment for significant other's gambling problem, %						
BSI, mean (SD)	49.05 (33.57)	40.01 (28.08)	<i>t</i> (29) = .65, <i>p</i> = .52	49.19 (26.23)	40.76 (47.12)	<i>t</i> (29) = .63, <i>p</i> = .53
Relationship Happiness Scale, mean (SD)	4.00 (2.08)	4.86 (2.96)	<i>t</i> (29) = .87, <i>p</i> = .39	4.09 (2.02)	4.50 (3.07)	<i>t</i> (29) = .43, <i>p</i> = .67
Relationship Assessment Scale, mean (SD)	8.67 (3.26)	10.57 (4.99)	<i>t</i> (29) = 1.20, <i>p</i> = .24	8.74 (3.33)	(4.76)	<i>t</i> (29) = .91, <i>p</i> = .37
Gambler characteristics						
DSM-IV-TR criteria, mean/10 (SD)	8.2 (1.63)	7.7 (1.11)	<i>t</i> (29) = .68, <i>p</i> = .49	8.35 (1.03)	7.25 (2.37)	<i>t</i> (29) = 1.82, <i>p</i> = .08
Length of gambling problem, mean in years (SD)	9.42 (8.80)	15.24 (12.94)	<i>t</i> (29) = 1.38, <i>p</i> = .18	10.41 (9.62)	11.65 (11.50)	<i>t</i> (29) = .30, <i>p</i> = .76
History of treatment for gambling problem, %	42%	43%	χ^2 (1) = .00, <i>p</i> = .64	39%	50%	χ^2 (1) = .29, <i>p</i> = .45
Days gambled in past 2 months, mean (SD)	9.85 (8.78)	7.78 (10.66)	<i>t</i> (29) = -.59, <i>p</i> = .61	9.72 (9.25)	8.44 (9.14)	<i>t</i> (29) = -.34, <i>p</i> = .74
Money gambled in past 2 months, mean amount (SD)	-\$1556 (1420)	-\$2066 (2025)	<i>t</i> (29) = .76, <i>p</i> = .45	-\$1717 (1683)	-\$1539 (1186)	<i>t</i> (29) = .27, <i>p</i> = .79
Type of gambling problem (VLTs/ slots), %	80%	86%	χ^2 (1) = .15, <i>p</i> = .59	83%	75%	χ^2 (1) = .22, <i>p</i> = .49

Note. CSO = concerned significant other; BSI = Brief Symptom Inventory; VLTs = video lottery terminals.

Table 3
Gambling Outcomes by Treatment Group and Effect Size (Cohen's d) for Gambling Outcome Variables Over the 6-Month Follow-up Period for Within Subjects and Between Groups

Gambling behaviour	Initial mean (SD)	3-Month mean (SD)	6-Month mean (SD)	Within subjects effect size ^b , paired samples <i>t</i> test, Cohen's <i>d</i> , CI	Between groups effect size ^b , independent samples <i>t</i> test, Cohen's <i>d</i> , CI
Days gambled					
Workbook (<i>N</i> = 8)	8.25 (9.75)	7.69 (5.97)	5.18 (4.59)	<i>t</i> (7) = 1.75, <i>p</i> = .12, <i>d</i> = 0.62, CI [-.16, 1.36]	<i>t</i> (15) = -.41, <i>p</i> = .69, <i>d</i> = 0.19, CI [$<$ 000, 1.03]
Individual (<i>N</i> = 9)	8.67 (8.90)	6.83 (5.60)	4.36 (4.32)	<i>t</i> (8) = 3.36, <i>p</i> = .01*, <i>d</i> = 1.12, CI [.25, 1.95]	
Dollars gambled					
Workbook (<i>N</i> = 8)	-1568 (1548)	-1496 (1951)	-923 (1392)	<i>t</i> (7) = -.79, <i>p</i> = .45, <i>d</i> = 0.28, CI [.00, .96]	<i>t</i> (14) = .87, <i>p</i> = .39, <i>d</i> = 0.44, CI [-.559, 1.42]
Individual (<i>N</i> = 8) ^a	-1808 (1834)	-943 (1951)	-313 (1392)	<i>t</i> (7) = -2.59, <i>p</i> = .04*, <i>d</i> = 0.92, CI [.00, 1.72]	

Note: CI = confidence interval

^a For dollars gambled, *N* = 8 for the individual intervention group, as one participant would not estimate an amount gambled. ^b All effect sizes are calculated by using the mean difference between initial and 6-month reports.

* Significant at *p* < .05.

estimate of dollars gambled and the 6-month follow-up report was small for the workbook group and large for the individual intervention group.

Hypothesis 3a: Assessment of CSO functioning (BSI). We predicted that participants in the individual intervention group would show greater improvement in personal functioning (i.e., decreased scores on the BSI) compared with those in the workbook group. There was no significant time effect, $F(1, 18) = .01, p = .91$, power = .05; group effect, $F(1, 18) = .03, p = .87$, power = .05; or group \times time interaction, $F(1, 18) = 1.28, p = .27$, power = .19. Means are presented in Table 4. The magnitude of the differences in BSI scores between groups over the 6-month follow-up period was medium. In considering effect sizes over time, both groups revealed medium-to-large effects.

Hypothesis 3b: Assessment of CSO-gambler relationship (RHS, RAS). We predicted that participants in the individual intervention group would report greater improvement in relationship functioning with the gambler than would those in the workbook group. For RHS, no significant time effect was found, $F(1, 18) = 2.04, p = .17$, power = .27. The group effect was non-significant, $F(1, 18) = 1.12, p = .30$, power = .17, as was the group \times time interaction, $F(1, 18) = .23, p = .64$, power = .07. The effect size between the groups was small at 6 months. The individual intervention group demonstrated large effect sizes by 6 months and the workbook group showed medium effects.

For the RAS, no significant effects were found: time effect, $F(1, 18) = .45, p = .51$, power = .10; group effect, $F(1, 18) = .05, p = .82$, power = .06; or group \times time interaction, $F(1, 18) = .78, p = .39$, power = .13 (Table 4). Participants in both groups increased scores, with small effect sizes attained by the workbook group and medium effects by the individual intervention group, with negligible differences between the groups.

Participant Evaluation of the Program

Each participant rated the extent to which the program met their needs, how satisfied they were with the program, and whether they would recommend the program to a friend in need of similar help. As displayed in Table 5, at the 3-month follow-up interview, participants in the individual intervention group were significantly more likely to rate that their needs were met, $\chi^2(3, N = 23) = 11.2, p = .011$, and that they would recommend the program, $\chi^2(3, N = 23) = 7.9, p = .048$; they were marginally more likely to rate that they were more satisfied with the program, $\chi^2(3, N = 23) = 7.5, p = .059$, than were the participants in the workbook group. At the 6-month interview, there was a significant difference between the groups on all three of the measures. Participants in the individual intervention group were more likely to rate that their needs were met, $\chi^2(3, N = 20) = 15.2, p = .002$, that they were satisfied with the program, $\chi^2(3, N = 20) = 16.77, p = .001$, and that they would recommend the program, $\chi^2(3, N = 21) = 14.3, p = .003$.

Table 4
Comparison of Outcome Measures by Treatment Group and Effect Size (Cohen's d) for Gambling Outcome Variables Over the 6-Month Follow-up Period for Within Subjects and Between Groups

Outcome measure	Initial mean (SD)	3-Month Mean (SD)	6-Month mean (SD)	Within subjects effect size ^a , paired samples <i>t</i> test, Cohen's <i>d</i> , CI	Between groups effect size ^a , independent samples <i>t</i> test, Cohen's <i>d</i> , CI
CSO functioning					
Brief Symptom Inventory					
Workbook	44.64 (23.04)	41.16 (26.44)	35.73 (31.60)	<i>t</i> (10) = 2.38, <i>p</i> = .04*, <i>d</i> = 0.72, CI [-.034, 1.37]	<i>t</i> (19) = -.94, <i>p</i> = .36, <i>d</i> = 0.41, CI [-.00, 1.25]
Individual	54.78 (32.40)	45.63 (27.71)	28.69 (33.21)	<i>t</i> (9) = 2.49, <i>p</i> = .04*, <i>d</i> = 0.79, CI [-.06, 1.48]	
Relationship assessment					
Relationship Happiness Scale					
Workbook	4.09 (1.58)	5.11 (1.89)	5.91 (2.49)	<i>t</i> (10) = -1.99, <i>p</i> = .07, <i>d</i> = 0.60, CI [-.00, 1.22]	<i>t</i> (19) = .72, <i>p</i> = .48, <i>d</i> = 0.32, CI [-.55, 1.17]
Individual	4.20 (2.66)	5.58 (1.90)	7.00 (2.50)	<i>t</i> (9) = -2.74, <i>p</i> = .02*, <i>d</i> = 0.87, CI [-.09, 1.57]	
Relationship Assessment Scale					
Workbook	8.09 (2.59)	10.41 (2.86)	10.38 (4.25)	<i>t</i> (10) = -1.17, <i>p</i> = .27, <i>d</i> = 0.35, CI [-.00, .94]	<i>t</i> (19) = .25, <i>p</i> = .80, <i>d</i> = 0.11, CI [-.75, .97]
Individual	10.30 (3.53)	9.95 (2.88)	11.48 (4.27)	<i>t</i> (9) = -1.68, <i>p</i> = .13, <i>d</i> = 0.53, CI [-.00, 1.17]	

Note. CSO = concerned significant other.
^a All effect sizes are calculated by using the mean difference between initial and 6-month scores.
 * Significant at *p* < .05.

Table 5
Comparison of Groups on Satisfaction Questions Regarding the Program at 3- and 6-Month Follow-ups

Group	3 Months					6 Months						
	How satisfied are you with the program?											
	Quite dissatisfied	Mildly dissatisfied/ Indifferent	Mostly satisfied	Very satisfied	Quite dissatisfied	Mildly dissatisfied/ Indifferent	Mostly satisfied	Very satisfied	Quite dissatisfied	Mildly dissatisfied/ Indifferent	Mostly satisfied	Very satisfied
Workbook Individual intervention	2 (16.7%) 1 (9.1%)	5 (41.7%) 0	3 (25%) 4 (36.4%)	2 (16.7%) 6 (54.5%)	2 (18.2%) 0	5 (45.5%) 0	4 (36.4%) 1 (11.1%)	0 8 (88.9%)				
	Did the program meet your needs?											
	None	Only a few	Most	Almost all	None	Only a few	Most	Almost all				
Workbook Individual intervention	2 (16.7%) 0	7 (58.3%) 1 (9.1%)	2 (16.7%) 3 (27.3)	1 (8.3%) 7 (63.6%)	4 (36.4%) 0	4 (36.4%) 0	3 (27.3%) 2 (22.2%)	0 7 (77.8%)				
	Would you recommend the program?											
	Definitely Not	Not really	Generally	Definitely	Definitely Not	Not really	Generally	Definitely				
Workbook Individual intervention	1 (8.3%) 1 (8.3%)	2 (16.7%) 1 (8.3%)	5 (41.7%) 0	4 (33.3%) 10 (83.3%)	2 (18.2%) 0	1 (9.1%) 0	6 (54.5%) 0	2 (18.2%) 9 (100%)				

Discussion

A new intervention for CSOs of problem gamblers was developed and tested in this randomized clinical trial. We predicted that participants who received the individual intervention would have greater success in engaging the gambler in treatment than would those who received the workbook. No differences were found between groups for gambler treatment entry rates, with 17.4% of gamblers attending treatment by the 6-month follow-up. It is unclear why in the current study and both CRAFT studies conducted to date (Hodgins, Toneatto, et al., 2007; Makarchuk et al., 2002) that the CSOs of problem gamblers were not as successful as the CSOs of substance abusers in engaging their significant other in treatment. The rates found in this study are much lower than those achieved in the substance abuse field, which range from 64% to 86% (Meyers, Miller, Hill, & Tonigan, 1999; Meyers, Miller, Smith, & Tonigan, 2002; Miller, Meyers, & Tonigan, 1999; Sisson & Azrin, 1986). One explanation for the differences in treatment engagement between studies of substance abuse and gambling may be that in all the studies by Meyers and colleagues, treatment for the substance abuser was readily available, which is not the case for problem gambling locally. The standard study procedure by Meyers et al. included a 24-hour access pager for weekends and after hours so that the substance abuser could contact someone to schedule an intake appointment, usually within 24-48 hours. In the current study, CSOs provided information to gamblers to attend either Gam-Anon or a counselling intake interview, and then to attend a group or be put on a wait list for individual treatment. Although treatment was available, access was not facilitated in the same way as in previous studies. It is possible that the difference in accessibility and availability of treatments for CSOs of problem gamblers versus substance abusers may account for the differences in treatment entry rates. Future CRAFT studies with CSOs of problem gamblers may offer an empirically supported treatment to the problem gambler that is readily available, thus making these studies more similar to prior CRAFT studies with CSOs of substance abusers.

We also hypothesized that participants who received the individual intervention would report lower levels of gambling behaviour by the gambler than would those who received only the workbook. All participants reported a statistically significant decrease in dollars gambled by the gambler over the follow-up periods. Overall, the magnitude of the decrease in dollars gambled reported by participants in the workbook group was classified as a small effect, whereas those in the individual intervention group achieved a large effect size. For days gambled, there was a small effect between the groups at 6 months, with participants in the workbook group achieving medium effects and those in the individual intervention group showing large effects over time. Such differences between groups in effect sizes provide initial support that CRAFT delivered to CSOs in an individual format is more successful than the CRAFT self-help workbook at influencing positive change in the problem gambler's behaviour.

We predicted that participants in the individual intervention group would show greater improvement in personal and relationship functioning compared with those

in the workbook group. There was no statistical difference between groups. However, effect sizes indicate that participants in both groups displayed improved personal functioning, with a trend for participants in the individual intervention group to show greater improvements compared with those in the workbook group. Both groups displayed decreased scores on the BSI over the follow-up periods, although it was not significant, with greater reductions reported by participants in the individual intervention group than by those in the workbook group. The magnitude of the difference between groups approached a medium effect size, which provides some support for the hypothesis that the individual intervention of CRAFT helped improve CSO personal and relationship functioning compared with the self-help workbook. Differences may also be due to therapist-guided intervention versus self-help intervention. Therefore, future studies would be wise to include a third comparison group of a non-CRAFT face-to-face therapist intervention.

Participants in both groups reported increased happiness in their relationship with the gambler. Slightly greater improvements were seen in the individual intervention group than in the workbook group (large vs. medium effect size, respectively), with a small effect size between groups observed at 6 months. Participants in both groups also rated their relationship with the gambler as improved, with small effect sizes between the groups attained by 6 months.

The majority of CSOs reported favourable evaluations of the program. However, participants in the individual intervention group were more likely to indicate that their needs were met, that they were satisfied with the program, and that they would recommend the program to a friend. The participants in the individual intervention group often cited contact with the therapist as helpful (e.g., therapist provided validation, provided reassurance in using techniques, was non-judgmental), whereas participants in the workbook group reported that there was not enough guidance to implement the techniques.

The urn randomization procedure was statistically successful in stratifying groups with no significant differences across initial assessment variables. Although no statistically significant differences were found, several differences seemed of prognostic importance. Participants in the individual intervention group had higher BSI scores, and they reported that the gambler had a gambling problem for a longer period, spent slightly more money, gambled more days on average, and used video lottery terminals and slot machines more than did those in the workbook group. These differences are noteworthy in that any lack of outcome differences between the groups may be confounded by the fact that the participants in the individual intervention group presented as more distressed and they dealt with a loved one who gambled more than did those in the self-help workbook group. To help counter possible confounds, we entered the initial rating of each outcome variable as a covariate in the analysis.

Methodological strengths of this study include therapist use of a treatment manual, random assignment to treatment condition, and follow-up interviews collected by a research assistant who was intended to be blind to treatment condition, thereby

eliminating interviewer bias. Together, these strengths bolster the internal validity of this study design. However, as mentioned earlier, one third to two thirds of research assistants determined group assignment prior to the end of the follow-up interview, which threatened internal validity.

A number of additional limitations are worth noting. One major limitation is that assessment and outcome measurements used with CSOs of problem gamblers are not well validated. Prior studies that have failed to find differences between groups could not determine whether the lack of differences was due to an actual lack of differences or poor measurement of the construct. Another limitation is that all information regarding the gambler's behaviour was obtained through reports of CSOs. However, in a study that examined precipitants of gambling relapses, overall kappa agreement between gamblers' reports and collateral reports was rated as fair to good (Hodgins & Makarchuk, 2003). In addition, prior research has demonstrated differences between treatment conditions on the basis of CSO reports of gambling behaviour (Hodgins, Toneatto, et al., 2007). Finally, the small sample size poses a major limitation. The final sample size was smaller than initially proposed because of recruitment problems and did not provide sufficient statistical power to detect small group differences. A related limitation is the moderate follow-up rates and the participants who were excluded from the analysis because of low confidence in their ratings, which further limited the sample size used in analysis. As a result of these limitations in sample size, most analysis focused on effect sizes between groups and over time to determine clinical significance.

Overall, the results of this study provide initial support for the provision of the CRAFT intervention in an individual format. Although participants who received the individual intervention did not have statistically better outcomes than did those who received the workbook, effect sizes indicate potential benefits for the individual intervention group. The lack of statistical differences between the CRAFT individual intervention and the CRAFT self-help workbook needs to be further clarified, given the major limitation of the small sample size.

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