

A Self-Help Manual for Problem Gamblers: the Impact of Minimal Therapist Guidance on Outcome

Michael D. Campos¹ · Richard J. Rosenthal¹ · Qiaolin Chen¹ ·
Jacqueline Moghaddam¹ · Timothy W. Fong¹

Published online: 27 August 2015
© Springer Science+Business Media New York 2015

Abstract We tested the impact of minimal therapist guidance with a workbook designed to aid in reducing or stopping gambling. Randomly assigned participants recruited from the community who met at least 2 DSM-IV criteria for pathological gambling received a workbook completed with therapist guidance (WB+G) or a workbook (WB only). Both groups met with a research assistant to monitor chapter completion and for data collection at each study visit. We examined the proportion of participants reporting any gambling, money spent gambling, and G-SAS scores during treatment, at the end of treatment, and at 1-year follow-up. Abstinence rates were higher among those in the WB+G condition, money spent gambling was lower for the WB only group during treatment, and both groups reported fewer G-SAS gambling symptoms at treatment completion and follow up. The workbook with guidance increased abstinence from gambling while in treatment and at follow-up more than the workbook alone.

Keywords Gambling · Self-help · Therapist guidance · In-treatment change

Estimates are that about 7 to 12 % of those with gambling problems seek professional therapy or participate in Gamblers Anonymous; however, as many as 33 % of those with pathological gambling disorder may recover on their own (Slutske 2006). Shame, stigma, cost, and the lack of available services are among reasons that have been cited as a barriers to utilization of professional treatment for gambling problems (Rockloff and Schofield 2004). Self-directed interventions, such as those in a self-help manual, may overcome such barriers in that they can be made readily accessible via the internet, can be anonymous as well as private, and can be distributed at low or no cost. Also, professionally prepared self-help materials may facilitate change by providing empirically supported techniques that augment attempts to quit or reduce gambling among those who choose self-directed change.

✉ Michael D. Campos
mdcampos@mednet.ucla.edu

¹ UCLA Gambling Studies Program, Semel Institute for Neuroscience and Human Behavior, 760 Westwood Plaza, Suite 38-167, Los Angeles, CA 90095-1759, USA

Minimal interventions in the addictions field, which often include self-help materials, have empirical support for their efficacy. Reviews of brief interventions for alcohol problems (Bien et al. 1993; Moyer et al. 2002) conclude that the accumulated literature suggests that alcohol use outcomes are superior among those who receive brief interventions relative to those in a control condition and are comparable to those for more extended professional interventions. No gender differences were found in one review with regards to response to brief interventions for alcohol-related problems; however, such interventions were more effective among those with less severe alcohol-related problems (Moyer et al. 2002). With regards to self-directed internet interventions for alcohol problems, one review concluded that such interventions were effective in reducing alcohol-related problems (Riper et al. 2011).

Others have argued that, although efficacy may be established for brief interventions, effectiveness in general health practice settings may be more problematic due to limited physician time, current screening practices, and lack of use of nurse practitioners for implementation among other reasons (Roche and Freeman 2004). Quality, empirically validated self-help materials can provide screening and intervention without the cost of physician time and can help with triage of gambling treatment needs. Those who successfully moderate or stop problem gambling behaviors via self-help may not need more intensive intervention. However, those who continue to gamble despite self-directed attempts to quit or reduce gambling could be referred to more intensive, specialty problem-gambling-treatment services. Using self-help materials as part of the continuum of care could make it easier to integrate gambling-related screening and intervention into general health practice settings.

Self-help manuals for gambling problems have been developed recently, not only as a supplement to professional therapy, but for use on their own. They would seem to be beneficial for gambling disorder because they can overcome the identified barriers to treatment utilization; however, efficacy and effectiveness testing for self-help manuals for gambling problems is in its infancy (Raylu et al. 2008). In short, we don't know how gamblers, working on their own, utilize such materials. We do, however, know that for the strategies employed by those choosing self-directed change often involve avoidance of gambling stimuli and engaging in new, non-gambling behaviors (Hodgins and el-Guebaly 2000).

Existing literature suggests that self-help materials for gambling problems may be effective. For example, Petry et al. (2006), in a study in which participants were randomly assigned to receive one of three interventions (GA referral alone; GA referral and a cognitive behavioral (CB) self-help workbook; GA referral, a CB self-help workbook, and eight sessions of therapy), showed that both groups receiving the CB self-help workbook had better outcomes than the GA referral alone group. Treatment completion outcomes for the group receiving CB workbook and the eight therapy sessions were similar to the group that received the CB self-help workbook alone. Furthermore, a 12-month follow up found no differences between these two groups on gambling symptoms, days gambled, or dollars gambled. These authors concluded that each workbook chapter completed or each therapy session attended was associated with a 28 % increase in abstinence at 1-year follow up (Petry et al. 2006, p. 562).

In a second study of a self-help workbook for gambling problems (Hodgins et al. 2001), individuals were randomly assigned to: (1) a 1-month wait list control group; (2) a group receiving only a data collection phone interview and a self-help workbook; and, (3) a group receiving a motivational enhancement telephone interview conducted by experienced psychologists and a self-help workbook. Individuals in the wait list control condition were eventually

assigned to group 2 or 3 after a 4-week waiting period. Findings from an analysis of all three groups 1 month after treatment entry found that all three groups showed significant improvement relative to baseline measures of days gambled, dollars lost, and dollars gambled per day. Importantly, however, an analysis of group assignment indicated that group receiving the motivational enhancement interview and the self-help workbook differed significantly from the wait list control group, but the workbook only group did not differ significantly from either group for days gambled, dollars lost, and dollars gambled per day.

A comparison of gambling outcomes between those initially assigned to the motivational enhancement plus workbook group versus the workbook only group indicated that both groups improved significantly relative to baseline, but the motivational enhancement plus workbook group showed greater improvement than the workbook only group on all gambling measures at 3-months post treatment initiation. At 6- and 12-months there were few differences found between the two groups on days gambled, dollars lost, or dollars gambled per day. A 24-month follow up of participants in the workbook only and motivational enhancement plus workbook groups (Hodgins et al. 2004) found that both groups sustained gains relative to baseline in terms of days gambled, dollars lost, and dollars gambled per day, but there was a group effect such that the motivational enhancement group had better outcomes at 24 months post-treatment.

Internet-based, self-help interventions may overcome barriers and support self-directed change in the same way that a self-help manual might. Carlbring and Smit (2008) evaluated such an intervention using a design that included very minimal contact with Master's level therapists. Results indicated that those receiving the internet-based, cognitive behavioral intervention with minimal therapist contact designed to reinforce change and answer questions about intervention materials showed improvements in pathological gambling, anxiety, depression and increased quality of life relative to a wait-list control group. These changes were sustained at follow up for the internet group at 6, 18, and 36 months post-treatment.

In summary, the studies above support the effectiveness of self-help materials in reducing problematic gambling behavior. Hodgins et al. (2001, 2004) supports the effectiveness of self-help materials in reducing problem gambling behaviors and also showed that the addition of a brief, telephone-based motivational enhancement interview can improve outcomes in the short- and longer-term. The Petry et al. (2006) showed that both self-help and therapist-facilitated cognitive behavioral interventions result in better outcomes than those seen for a group receiving only a referral to GA. Finally, Carlbring and Smit (2008) suggests that self-help interventions with little interaction with a therapist can result in positive treatment outcomes for not just gambling, but also anxiety, depression, and quality of life.

This study sought to test a self-help manual for gambling problems while isolating minimal therapist guidance as a factor in self-help outcomes for gambling problems using a two-group design with random assignment. One group received a self-help workbook plus minimal therapist guidance involving five infrequent meetings with a psychologist during which questions about chapter content were answered, main points were emphasized, supportive feedback for change was given, and completion of homework was monitored. The other group received a self-help workbook plus infrequent monitoring of chapter completion in the form of five short visits with a research assistant who monitored the completion of each chapters' exercises, but provided no other feedback. Previous work in the alcohol literature has employed a self-help versus

therapist guidance design (e.g., Harris and Miller 1990), thus, we sought to implement such a design in the study of self-help for gambling problems.

The workbook used in this study (“Freedom from Problem Gambling”; available online at: http://problemgambling.securespsites.com/ccpgwebsite/pdf/sample_workbook_v3.pdf) was designed to help individuals understand their gambling behavior, its impact on their life, and offered strategies designed to help them stop or reduce gambling. The workbook was based on the clinical expertise and experience of two of the authors (TWF and RJR). Exercises included in the workbook were designed to raise awareness of problematic gambling behavior, increase understanding of one’s reasons for gambling, increase motivation for behavior change, reduce access to money, change faulty cognitions about gambling, and present tools to help establish and maintain abstinence from gambling. Because the workbook is freely available for download, we do not describe specific chapter content and exercises, rather, we refer the reader to the workbook itself for this information.

The independent variable in this study was therapist guidance, with one group receiving minimal therapist guidance and the other receiving only monitoring by a research assistant. The dependent variables in this study were the following: the proportion of participants who reported any gambling in the 2 weeks prior to each study visit, the amount of money spent gambling for participants who reported any gambling, and gambling-related symptoms. We hypothesized that both groups would show reduced gambling and reduced gambling-related symptoms after treatment, but individuals receiving therapist guidance would show greater reductions than those not receiving guidance from a therapist. Further, we expected that gains made during treatment would be maintained at follow-up (approximately 1-year post-baseline assessment).

Methods

Setting and Participants

All study visits were conducted at our group’s research offices on the campus of a large university in Los Angeles. All study materials and procedures received approval by our university’s IRB. Subjects were recruited from the community, local casinos, and treatment providers via flyers and advertisements. Flyers were posted in local casinos, advertisements were printed in two local newspapers, and online advertising specific to Los Angeles was used. Contact information for our research group was included in all recruitment materials so that interested individuals who wanted to reduce gambling-related problems could obtain more information about the study. Inclusion criteria were as follows: (a) age 18 or older; (b) English proficiency at or above an 8th grade level; (c) positive screen on the SOGS or NODS for pathological gambling symptoms and endorsement of at least 2 DSM-IV criteria for pathological gambling on the SCI-PG; (d) gambled within 4 weeks of screening; and (e) willingness to provide follow-up contact information. Exclusion criteria included: (a) current gambling treatment, not including Gamblers Anonymous; (b) meeting criteria for another psychiatric disorder that would impair judgment or medical decision-making capacity; (c) current incarceration or pending incarceration; (d) current enrollment in another research protocol; and (e) a positive urine test for a substance of abuse. Psychiatric co-morbidity was not an automatic rule-out for

study participation. Individuals were only excluded from the study if their psychiatric symptoms were uncontrolled and impeded their ability to provide consent or otherwise participate in treatment for gambling problems.

Procedure

Interested individuals who called our offices were given a description of the study and the inclusion/exclusion criteria, were informed of the purpose of the research study, the procedures for participation, and the voluntary nature of the study. Those who wanted to participate in the study were scheduled for an eligibility screening visit with a study research assistant. Prior to any data collection, participants provided written informed consent for all study procedures. During screening, participants filled out self-report measures, completed a structured interview about psychiatric symptoms, completed a structured interview about their gambling behavior and its consequences, and provided an unmonitored urine sample tested for metabolites of drugs of abuse. After screening to determine eligibility, qualifying participants were randomized using a random number generator to either the workbook only or the workbook plus therapist guidance conditions. We used no stratification variables in making these assignments and blinding to study condition was not possible.

Participants returned the following week (study week 1) and were given a self-help workbook, informed of their study group assignment, and asked to read through the first chapter and complete its exercises. Subsequent visits with either a research assistant or a therapist occurred at weeks 2, 4, 8, 12, and 20. At each study visit, participants completed one measure of gambling symptoms and one measure of gambling behavior. Follow-up occurred approximately 1 year after intake (week 52) and was conducted by a research assistant. All participants received monetary compensation (\$20.00 grocery gift card) for attendance at each study visit. Figure 1 presents the flow of participants through the study protocol.

Intervention

Workbook Only Group (WB only). Individuals in this group were assigned one chapter in the order they appeared in the workbook prior to each study visit. They were free to use the workbook in any way they chose, otherwise. When individuals in this group returned for each visit at weeks 2, 4, 8, 12, and 20, the research assistant checked to see that the chapter exercises were completed for that visit, then had the participant complete the in-treatment data collection forms; the research assistant did not provide guidance in the completion of the workbook. Each meeting lasted approximately 15 to 20 min. The purpose of assigning chapters was to ensure that people completed the workbook exercises.

Workbook with Therapist Guidance Group (WB+G). Like the workbook only group, individuals in this condition completed one chapter in the order they appeared in the workbook prior to each study visit. Subsequent to receiving the workbook at study week 1, individuals in this group met with the same PhD-level psychologist at weeks 2, 4, 8, 12, and 20. At each of these meetings the therapist reviewed the relevant chapter, emphasized the major points, checked that exercises were completed, and answered any questions regarding chapter content or exercises. The therapist also provided supportive feedback for gambling behavior change. The total time spent for each of these visits was 45 to 50 min. Prior to each visit with the therapist, the research assistant met with the participant and had them complete the in-treatment data collection forms.

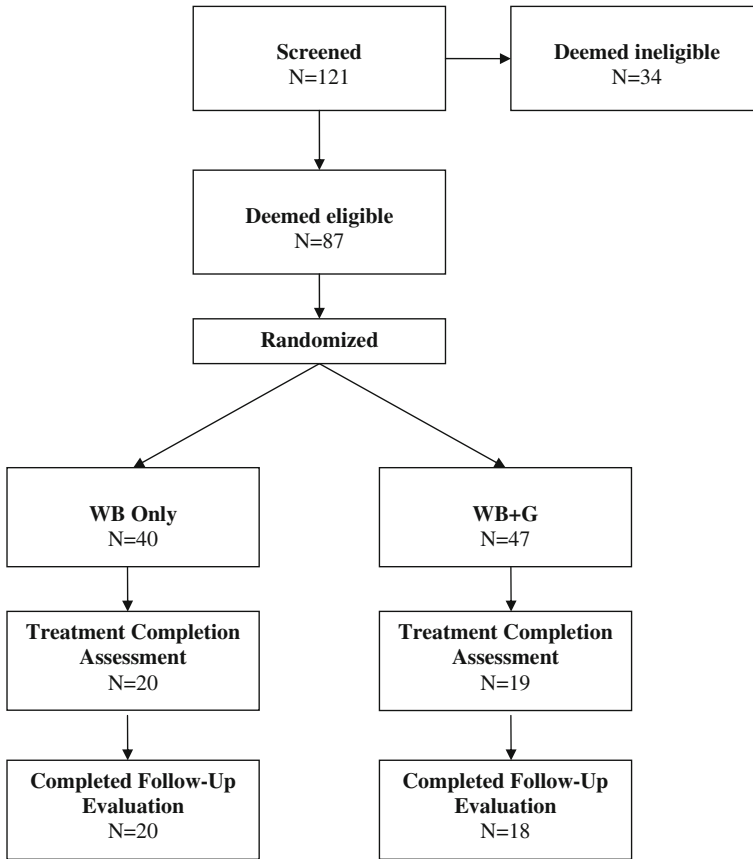


Fig. 1 Flow of participants through study protocol

Measures

Screening

Mini-International Neuropsychiatric Interview Version 2.0 (MINI; Lecrubier et al. 1997) The MINI is a short, 15-min structured diagnostic interview used for screening for major depressive disorder, dysthymia, suicidality, mania, hypomania, panic disorder, agoraphobia, social phobia, obsessive-compulsive disorder, post-traumatic stress disorder, alcohol dependence/abuse, substance dependence/abuse, psychotic disorders, anorexia nervosa, bulimia nervosa, generalized anxiety disorder, and antisocial personality disorder. Kappa for diagnoses made by the MINI and the Composite International Diagnostic Interview (CIDI) range from 0.36 for generalized anxiety disorder to 0.82 for alcohol dependence (Lecrubier et al. 1997). The validity and reliability of this instrument has been compared to longer diagnostic interview tools and clinical judgments (Lecrubier et al. 1997; Sheehan et al. 1998).

National Opinion Research Center DSM-IV Screen For Gambling Problems (NODS; Gerstein et al. 1999) Questions from the 17-Item NODS were adapted for self-

report administration, resulting in a 10-item, yes-no response format, screening questionnaire for problem and pathological gambling. The ten items correspond with DSM-IV criteria for pathological gambling. Individuals scoring five or more are considered probable pathological gamblers. Although no formal analysis of psychometric properties for this adaptation of the NODS are available, Cronbach's alpha for this scale in the current sample was 0.84.

Structured Clinical Interview for Pathological Gambling (SCI-PG; Grant et al. 2004) The SCI-PG is a structured clinical interview based on DSM-IV criteria for PG. The instrument contains ten probe items for inclusionary, and one item for exclusionary criteria (Grant et al. 2004; pp. 80). Positive responses on five of ten inclusionary items with a rule out for mania better accounting for gambling behavior results in a diagnosis of pathological gambling. Reported psychometric properties for the SCI-PG are as follows: inter-rater reliability ($\kappa=1.00$) and test-retest reliability ($\kappa=1.00$) for the SCI-PG has been shown to be excellent; concurrent validity with the SOGS is high ($r=0.78, p<0.001$); sensitivity (0.882), specificity (1.00), positive predictive value (1.00) and negative predictive value (0.666) are all high (Grant et al. 2004).

South Oaks Gambling Screen (SOGS; Lesieur and Blume 1987) The South Oaks Gambling Screen is a 20-item, self-report instrument based on DSM-III criteria that assesses gambling behavior and consequences. Individuals with positive responses to five or more of the SOGS items are categorized as probable pathological gamblers. Principal components factor analysis of the SOGS in a sample of treatment-seeking pathological gamblers resulted in the extraction of one factor with an eigenvalue of 6.2 that accounted for 31 % of the variance and Cronbach's alpha for the scale was 0.86 (Stinchfield 2002; p. 9). Data supporting construct validity for the scale include significantly higher scores on the SOGS for gamblers seeking treatment relative to a general population sample and the SOGS was found to discriminate between a general population sample and a gambling treatment group (sensitivity=0.91; specificity=0.995; false positive rate=0.003; false negative rate=0.14) (Stinchfield 2002). Convergent validity has been demonstrated in relation to DSM-IV criteria ($r=0.77$, general population; $r=0.83$, gambling treatment group) and classification accuracy in a gambling treatment sample is good (sensitivity=0.99; specificity=0.75, false positive rate=0.04; false negative rate=0.10) (Stinchfield 2002).

Urine Toxicology Screening Research assistants collected a unmonitored urine sample which was tested for metabolites of cocaine, amphetamine, methamphetamine, marijuana, and opiates using a test cup (E-Z Split Key[®] Cup; Rapid Detect, Inc.; Catalog Number DOA-1257-09A; <http://www.ezkeycup.com>). If urine-test results were positive for any of these drug metabolites, participants were notified and excluded from participation in the research study. Urine samples were destroyed as soon as the toxicology test results were complete.

In Treatment and 1-Year Follow Up

Gambling Diary Tool This measure was designed by the UCLA Gambling Studies Program. The measure used a 2-week calendar on which participants self-reported the number of hours spent gambling for each day on which they gambled, the amount of money they started with, the total won/lost during each gambling episode, and the type of gambling activity in

which they engaged. Hodgins and Makarchuk (2003) supports the use of self-report gambling information in treatment studies.

Gambling Symptom Assessment Scale (G-SAS; Kim et al. 2009) The G-SAS is a 12-item, self-report scale with a past-7-day time frame assessing three gambling-symptom-related domains: urges, thoughts, and gambling behavior. Items are scored on a scale measured from 0 to 4. The measure was designed to provide information in treatment and to allow for the examination of patterns of symptom change across the three domains assessed. Higher scores on the G-SAS indicate greater symptom severity. Test-retest reliability ($r=0.56$) and convergent validity with another measure of gambling symptoms, the Yale-Brown Obsessive-Compulsive Scale for Pathological Gambling (PG-YBOCS; Pallanti et al. 2005), was high ($r=0.81$) (Kim et al. 2009).

Screening and Dependent Variables

Screening for study eligibility was accomplished using the MINI, SCI-PG, SOGS, and NODS. The primary dependent variables were derived from the self-report Gambling Diary Tool (proportion of participants who gambled, money spent gambling if participants gambled), and the G-SAS score.

Data Analysis

Preliminary Analyses We examined demographics and baseline characteristics, including co-occurring psychiatric diagnoses, by study group using One-Way ANOVAs for continuous variables, Mann–Whitney U tests for ordinal variables, and Chi-Square tests for categorical variables. Examination of baseline characteristics involved comparison of study groups on gambling-related variables including age of first gambling, age of first gambling-related problem, days gambled in the past month, money lost in the past month, G-SAS scores, SOGS scores, SCI-PG Scores, and NODS scores. Prior to conducting our main analyses, we used a two-sample t-test to test for differences in mean number of sessions attended by treatment group.

Main Analyses Because the distribution of money spent gambling was positively skewed with a large concentration of subjects reporting no gambling, and suffered from a large amount of missing data, a linear mixed model for normal data was inappropriate. Thus, we analyzed the proportion of subjects who gambled, and the money spent gambling for those who gambled separately using a 2-part, random effects model. For the proportion of subjects who gambled, a generalized linear mixed model with logistic link and random intercepts was used. In order to examine changes in gambling behavior for those who reported any gambling, we used a linear mixed model for the log of money spent gambling. Similarly, we used a linear mixed model for G-SAS scores. Because there were no baseline differences for G-SAS scores, the mixed model used the same baseline for the two study groups. Due to differences in the trend between the intervention period and follow-up point, all mixed models allow for separate means at 52-week follow-up. All mixed models include the following covariates: time, group membership, the time by group interaction, tests for differences between baseline and 52-week follow-up, and extrapolation of straight lines for WB+G and WB only.

Results

Preliminary Analyses

Table 1 presents information on demographics and gambling characteristics by treatment group. Of the 87 subjects, 40 were randomized to the WB only group, while 47 were randomized to the WB+G group. No significant differences were found between the two groups on any of the demographic and background variables or on intake NODS scores. On average, participants in our study were in their early to mid 40s, primarily male, African American or White, the majority had some college education or more, most were unmarried, most had either full or part-time employment, and the income range most commonly reported was 0 to 25 thousand dollars per year. The mean(SD) number of sessions attended by the WB only group (3.3 [2.1]) was not significantly different from the mean number of visits attended by those in the WB+G group (3.0 [2.1]). Baseline NODS scores were not significantly correlated with any dependent variables (all p -values >0.48), treatment completion (p -value >0.84), or total number of visits (p -value >0.21).

Examination of the prevalence of psychiatric conditions by treatment group indicated that the WB only and WB+G groups differed only on the prevalence of generalized anxiety disorder. There was a higher percentage of individuals in the WB only condition who reported lifetime generalized anxiety disorder relative to the WB+G condition; however, generalized anxiety disorder had no significant correlations with dependent variables (all p -values >0.30). Similarly, there was no significant correlation between generalized anxiety disorder and treatment completion (p -value >0.69). The correlation for generalized anxiety disorder and total number of visits reached the trend level ($r=0.20$, p -value $=0.07$).

Overall, attrition from the study was high, with approximately 50 % of participants who started the study discontinuing prior to the final intervention visit. We conducted analysis of demographic and gambling characteristics between WB+G and WB only groups for those with all five treatment visits to determine if there were systematic differences between groups as a result of attrition (analyses not shown; available from the author). These analyses indicated that the two groups did not differ on demographic and background characteristics.

Main Analyses

Proportion Reporting Any Gambling Data on the proportion of individuals reporting any gambling activity in the 2 weeks prior to each visit is presented in Table 2 and graphed in Fig. 2a. A GLMM with random intercept and logistic link was fitted to the proportion of individuals reporting any gambling. The baseline t -test for group equivalence on proportion reporting any gambling was not significant ($p=0.26$), thus identical intercepts were used for both groups. Since the pattern of means at follow-up had a different trend, a linear time trend was fit to the data from baseline to completion, while allowing a separate mean at follow-up.

For the WB+G group, there was a significant decrease (slope $=-0.025$, $s.e.=0.005$, $p<0.0001$) from baseline to study completion in the proportion of individuals gambling. The odds ratio for reporting any gambling was 0.975 (95 % CI [0.966, 0.984]), suggesting that for a 1 week increase in intervention time, we saw about a 2.5 % decrease in the odds of any gambling activity for those in the WB+G group. The increase in the proportion of individuals reporting any gambling from completion to follow-up was also significant ($p=0.04$), but overall there was a significant decrease from baseline to follow-up ($p=0.01$) in the proportion of individuals reporting gambling.

Table 1 Demographic and background characteristics by study condition

N (%)	WB only	WB+G
Gender		
Male	28 (70.0 %)	38 (80.9 %)
Female	12 (30.0 %)	9 (19.1 %)
Marital status		
Married	11 (28.2 %)	9 (19.6 %)
Separated/divorced	8 (20.5 %)	14 (30.4 %)
Single/widowed	20 (51.3 %)	23 (50.0 %)
Past year income ^a		
0 to 25 K	20 (50.0 %)	20 (45.5 %)
25 to 50 K	10 (25.0 %)	16 (36.4 %)
50 K or More	10 (25.0 %)	8 (18.2 %)
Education ^a		
H.S./GED or less	7 (17.5 %)	9 (19.6 %)
Some college	15 (37.5 %)	20 (43.5 %)
College graduate or more	18 (45.0 %)	17 (37.0 %)
Employment status		
Full time	19 (47.5 %)	16 (34.8 %)
Part time	11 (27.5 %)	8 (17.4 %)
Unemployed/student/other	10 (25.0 %)	22 (47.8 %)
Ethnicity		
Non-Hispanic Caucasian	17 (42.5 %)	21 (45.7 %)
African-American	13 (32.5 %)	15 (32.6 %)
Asian	6 (15.0 %)	4 (8.7 %)
Other	4 (10.0 %)	6 (13.1 %)
Co-occurring axis I disorders		
Major depressive disorder	8 (20.5 %)	8 (17.4 %)
Dysthymia	5 (12.8 %)	4 (8.7 %)
Generalized anxiety disorder*	9 (23.1 %)	3 (6.5 %)
Psychotic disorders	1 (2.6 %)	1 (2.2 %)
Alcohol abuse/dependence	1 (2.1 %)	2 (4.3 %)
Marijuana abuse/dependence	2 (5.4 %)	2 (4.3 %)
Mean (SD)		
Age	43.4 (10.8)	45.1 (11.0)
Age first gambled	19.8 (8.7)	20.5 (10.8)
Age first problem with gambling	28.6 (11.8)	28.3 (14.6)
Past month days gambled	1.5 (1.0)	1.6 (0.9)
Past month losses (In thousands)	\$1.7 (3.5)	\$4.5 (12.4)
Baseline G-SAS score	25.3 (9.3)	23.2 (8.8)
Baseline SCI-PG score	6.4 (2.6)	6.3 (2.1)
Baseline SOGS score	11.1 (4.6)	10.3 (4.1)
Baseline NODS score	6.7 (2.5)	6.7 (2.3)

No significant differences found between groups on any demographic or background variables other than the prevalence of generalized anxiety disorder using Chi-Square tests for categorical variables and independent samples t-tests for continuous variables

^a Mann–Whitney *U* test used

**p*<0.05

For the WB only group, neither the change in odds of gambling from baseline to completion nor the change from completion to follow-up was significant ($p=0.86$ and $p=0.44$, respectively). Thus, there was no decrease in the proportion of individuals reporting any gambling activity during the course of treatment in the WB only group. Furthermore, a statistically similar proportion of individuals in WB only group were gambling at follow-up relative to baseline.

The difference in the slopes for the two groups was significant ($p<0.0001$) at treatment completion, although the difference at follow-up was not ($p=0.13$). This finding indicates that the rate of change in the proportion of individuals who reported any gambling activity was greater among those in the WB+G relative to the WB only condition during treatment. However, because the two groups did not differ with regards to follow-up gambling activity, there appears to have been some relapse to gambling activity that occurred among those in the WB+G condition.

Money Spent Gambling The untransformed money spent gambling, if study participants reported any gambling, is presented in Table 2 and the $\log_{(10)}$ transformed money spent gambling is plotted by visit in Fig. 2b. Since there were no significant differences at baseline between the two treatment groups using t-tests ($p=0.60$ and $p=0.98$, respectively), linear mixed models with the same baseline values for both groups were fitted to the $\log_{(10)}$ transformed money spent gambling with time, group, and time by group interactions included as predictors. Results of this analysis indicated an effect for time for the WB only condition

Table 2 Proportion of individuals gambling, money spent gambling for those who gambled, and G-SAS scores at each study visit by treatment group

Variable	Visit	WB only Mean (SD)	WB+G Mean (SD)
Proportion gambling	1	0.91 (0.28)	0.83 (0.38)
	2	0.74 (0.45)	0.57 (0.51)
	3	0.88 (0.34)	0.65 (0.49)
	4	0.85 (0.37)	0.53 (0.52)
	5	0.85 (0.37)	0.32 (0.48)
	6	0.80 (0.41)	0.56 (0.51)
Money spent gambling	1	6.4 (19.2)	25.8 (113.8)
	2	8.0 (23.3)	3.0 (5.2)
	3	7.4 (19.2)	3.9 (5.6)
	4	5.1 (11.9)	2.5 (4.2)
	5	4.5 (13.5)	2.9 (4.9)
	6	20.4 (54.6)	2.5 (4.6)
G-SAS scores	0	25.3 (9.3)	23.2 (8.8)
	1	28.6 (9.6)	24.5 (10.0)
	2	24.1 (9.5)	21.0 (8.4)
	3	25.3 (9.4)	19.6 (11.7)
	4	22.9 (10.8)	14.8 (10.3)
	5	22.4 (12.0)	12.0 (9.7)
	6	23.4 (12.9)	19.2 (10.6)

Money spent gambling is presented in thousands

G-SAS gambling symptoms assessment scale

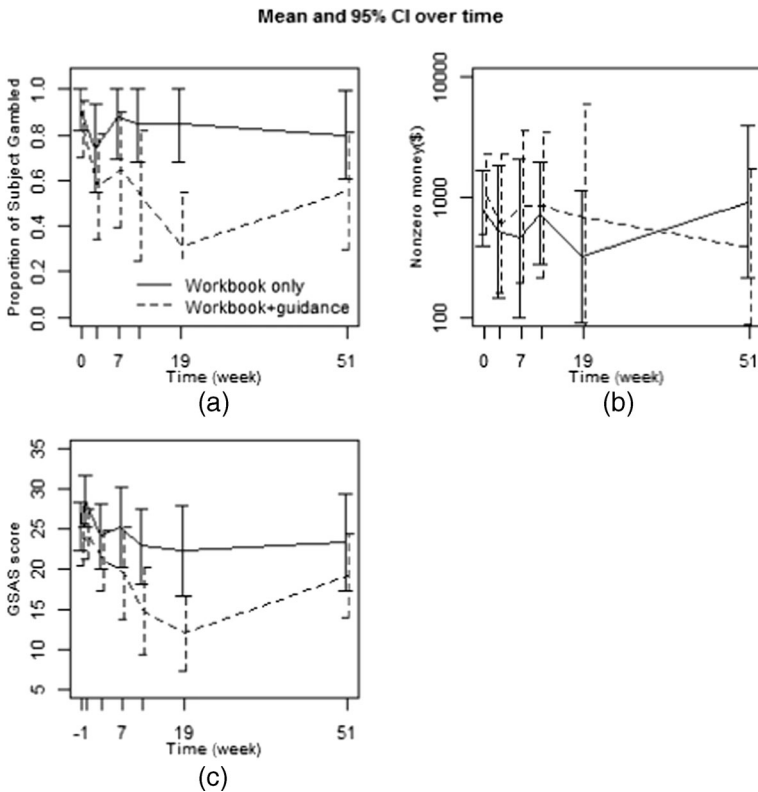


Fig. 2 Plot of means and 95 % confidence intervals for primary outcomes over time. Note: **a** Empirical summary plot of proportion and the 95 % CI for proportion subjects who gambled by time. **b** Empirical plot of the mean and 95 % CI for the mean of non-zero money gambled on the log₁₀ scale. **c** Empirical plot of the means and 95 % CI for the mean G-SAS scores

(slope = -0.02 ; $p < 0.01$), but not for the WB+G condition (slope = -0.01 , $p = 0.38$). The slopes for the two groups were not significantly different, and no differences were found between baseline and 1-year follow up values for money spent gambling (Table 3).

Gambling Symptoms Assessment Scale (G-SAS) Score Data on G-SAS scores by study visit are presented in Table 2 and graphed in Fig. 2c. The G-SAS scores in both groups decreased over time. Because there were no significant differences at baseline between the two groups using t-tests ($p = 0.27$), linear mixed model with the same baseline values for both groups were fitted to the G-SAS score using time, group, and time by group interactions as predictors. The G-SAS scores for the WB+G group and the WB only group showed significant decrease over time (slope = -0.58 , $p < .01$ and slope = -0.24 , $p < 0.01$, respectively), the difference found between the slopes for decrease in G-SAS scores was also significant (slope difference = -0.34 , $p = 0.01$). Both groups showed significant reductions in G-SAS scores from baseline to follow up. These findings indicate that problem gambling symptoms, as measured by the G-SAS, were reduced over time for the WB+G and the WB only groups. However, the rate of reduction was greater in the WB+G group and both groups sustained reductions at follow up relative to baseline.

Table 3 Parameter estimates for the probability of any gambling, the log of money spent gambling for those who gambled, and G-SAS scores by treatment group

Outcome	Effect	Estimate (SE)	<i>t</i> -value	<i>p</i> -value
Any gambling	Intercept	1.68 (0.29)	5.71	<0.01
	Time for WB+G	−0.13 (0.03)	−4.13	<0.01
	Time for WB only	0.01 (0.04)	0.36	0.72
	WB+G—WB only	−0.15 (0.04)	−3.31	<0.01
	Extrapolation WB+G	5.41 (1.54)	3.51	< 0.01
	Extrapolation WB only	−1.09 (1.87)	−0.58	0.56
	End of Tx group differences	−0.97 (0.85)	−1.14	0.26
	Baseline vs. follow up WB+G	−1.36 (0.61)	−2.25	0.03
	Baseline vs. follow up WB Only	−0.39 (0.68)	−0.58	0.56
Log money spent	Intercept	1.68 (0.29)	5.71	<0.01
	Time for WB+G	−0.01 (0.01)	−0.9	0.38
	Time for WB only	−0.02 (0.01)	−3.0	<0.01
	WB+G—WB only	0.01 (0.01)	1.0	0.32
	Extrapolation WB+G	0.23 (0.56)	0.4	0.68
	Extrapolation WB only	1.19 (0.37)	3.2	<0.01
	End of Tx group differences	−0.28 (0.28)	−1.0	0.31
	Baseline vs. follow up WB+G	−0.29 (0.29)	−1.0	0.34
	Baseline vs. follow up WB only	−0.02 (0.23)	−0.1	0.94
	G-SAS scores intercept	25.09 (0.91)	27.5	<0.01
	Time for WB+G	−0.58 (0.09)	−6.3	<0.01
	Time for WB only	−0.24 (0.09)	−2.7	0.01
	WB+G—WB only	−0.34 (0.12)	−2.7	0.01
	Extrapolation WB+G	25.71 (4.65)	5.5	<0.01
	Extrapolation WB only	8.66 (4.51)	1.9	0.06
	End of Tx group differences	−0.60 (2.71)	−0.2	0.82
	Baseline vs. follow up WB+G	−4.50 (1.99)	−2.3	0.02
Baseline vs. follow up WB only	−3.89 (1.88)	−2.1	0.04	

Discussion

In this study we compared the gambling-related outcomes of those who received a self-help workbook with monitoring by a research assistant to outcomes for those who received the same self-help workbook with guidance from a therapist. The goal of the study was to test the impact of minimal therapist guidance when completing self-help materials for gambling problems. In order to keep the dosage of therapist guidance to a minimum, study visits were spaced out across 20 weeks (study weeks 2, 4, 8, 12, 20). Follow-up was conducted at 1-year after study entry. The dependent variables examined were abstinence from gambling, money spent gambling, and gambling symptoms as assessed by the G-SAS.

No differences were found between groups for any background or demographic variables when we examined the full sample and when we examined a subsample of those who completed the study. A notable percentage of respondents reported co-occurring psychopathology, which was not unexpected given the literature on co-morbidity in pathological gambling

(e.g., Lorains et al. 2011; Petry et al. 2005). Mood disorders were the most frequently reported co-occurring condition, followed by generalized anxiety disorder, substance disorders, and psychotic disorders, respectively. Although the two study groups did not differ on demographic variables, background characteristics, and most types of co-occurring diagnoses, we found that more individuals in the WB only group met criteria for generalized anxiety disorder; however, this variable was not significantly related to outcome variables except for a trend towards fewer treatment visits among those with generalized anxiety disorder.

Our dropout rate (approximately 50 %) was not unexpected and was similar to other studies of gambling-problem treatment in the literature (e.g., Carlbring and Smit 2008; Ladouceur et al. 2001; Kim et al. 2001). One possible explanation for the dropout rate seen in this study was the long intervals between study visits. We looked at both generalized anxiety disorder and gambling problem severity at intake and found that intake NODS scores were unrelated to dropout, but generalized anxiety disorder was related to the number of treatment visits attended. Individuals with generalized anxiety disorder may need additional intervention to increase treatment attendance.

We examined dependent variables using two time frames: intake to end of treatment and intake to 1-year follow up. Data for the dependent variables were collected during treatment at each treatment visit, followed by a single 1-year follow up assessment. Thus, the study provides information on the course of change during treatment and the durability of change over time after treatment completion.

Three findings emerged from the analysis of the in-treatment time period. First, the WB only group showed a reduction in money spent gambling if any gambling occurred during treatment. However, for the WB+G group, those who gambled while in treatment showed no significant reduction in money spent gambling. Second, fewer individuals in the WB+G group gambled while in treatment. This was not the case for the WB only group. The proportion of individuals who were gambling during treatment in the WB only group was statistically the same as the proportion who reported any gambling at baseline. Third, gambling symptoms as measured by the G-SAS showed reductions in both groups while in treatment. A key aspect of this finding was that the reductions in G-SAS scores occurred more quickly for the WB+G group relative to the WB only group. Taken together, these findings suggest that the workbook helped those who did not receive guidance to reduce the money they spent on gambling, albeit only temporarily. However, for those who received guidance *and* the workbook, stopping gambling entirely was more likely and any change in gambling behavior happened faster than for the WB only group. Gambling symptoms, as measured by the G-SAS, decreased for both groups during treatment.

The discrepancy between the change described by G-SAS scores and that described by the other measures of gambling behavior complicates the interpretation of the findings from our study. One difference between these measures was the time frame each employed. The self-reported gambling behavior was assessed using a 2-week time frame, but the G-SAS uses a past 7-day time frame. This difference in time frames may have resulted in fewer individuals reporting gambling symptoms on the G-SAS because there was less of an opportunity for symptoms to be detected.

Analyses of follow-up data indicated a decay in treatment gains from baseline to 1-year post-admission among both groups; however, fewer individuals in the WB+G condition reported gambling at follow up than at baseline. For the WB only group a statistically equal number of individuals reported gambling at follow-up relative to baseline. These findings, in conjunction with the in-treatment findings, show that more individuals in the WB+G group

established abstinence during treatment and many maintained abstinence even 1-year post treatment admission. Conversely, for the individuals in the WB only group, a statistically equal number of individuals reported gambling at baseline and follow-up and the amount of money spent at both points was similar. Thus, any reductions in money spent gambling for the WB only group were limited to the in-treatment period. G-SAS scores for both groups were lower at follow-up relative to baseline, suggesting a sustained decrease in self-reported gambling-related symptoms from baseline to follow-up. The difference between gambling behavior outcomes and G-SAS scores is interesting in that despite some decay in gains made during treatment, both groups reported fewer gambling-related symptoms on the G-SAS but only the WB+G group showed sustained change on the measures of gambling problems. For example, the WB only group was gambling with the same amount of money at follow-up as at baseline, but they were reporting fewer G-SAS symptoms. As mentioned before, the two measures employed different time frames making equating them difficult. Individuals who were still gambling at problematic levels from the WB only group may not have experienced significant gambling-related symptoms within the 7-day time frame of the G-SAS, but the longer 2-week time frame for reporting gambling behavior may have captured more gambling activity.

The changes seen with regards to money spent gambling suggest that the WB only group was better able to moderate gambling behavior, at least while in the study. For those in the WB+G group who gambled, there was no reduction in money spent gambling. This may have been due to a particular kind of loss of control. That is, for those who started to gamble it was difficult to stop and resulted in within-gambling-session loss of control. It may be that the individuals in the WB+G group who continued to gamble were more severe problem gamblers. It may be possible that these individuals set controlled gambling as a goal and were unable to attain that goal. The advantage for the WB only group on money spent gambling was not present at follow up. Abstinence rates were still better relative to baseline for the WB+G group relative to baseline.

Our findings were not as clear cut as those seen in Petry et al. (2006), Hodgins et al. (2001, 2004), and Carlbring and Smit (2008). Our results differ from those of Petry et al. (2006). In their study there were no differences found between the group receiving only a self-help workbook and the group receiving cognitive behavioral intervention by a therapist, with both showing improvement. In our study, we saw some gains made during the treatment period for the WB only group, but the WB+G group outperformed the WB only group with regards to G-SAS scores and abstinence rates while in treatment. Furthermore, the WB+G group showed significant differences between baseline and follow up with regards to abstinence, showing that many individuals who established abstinence during treatment were able to sustain that abstinence despite some decay in gains. Like Petry et al. (2006), we found a reduction in the odds of gambling with each session attended, but only for the WB+G group.

Our findings have some commonalities with those from Hodgins and colleagues (2001, 2004). First, we found that those receiving a self-help workbook with some contact from a therapist showed reductions in gambling behavior. Second, those receiving the workbook alone in Hodgins et al. (2001) did not have as good outcomes as those with some therapist contact. Hodgins et al. (2001) found that those receiving a workbook did no better than the wait-list control, but all groups in the study fared better relative to intake. Our study design differed from that of Hodgins et al.'s study (2001) in that we lacked a no-treatment or wait-list

control group so we could not assess the influence of the screening and diagnostic procedures on behavior change. Carlbring and Smit (2008) found that an internet-based, self-help program with minimal contact from a therapist was effective in reducing gambling behavior, depression, anxiety, and improving quality of life among those who received it relative to a wait-list control, but this study did not isolate the effects of therapist guidance alone. Our findings related to the WB+G condition seem to parallel those of Carlbring and Smit (2008) in that some gains were maintained at treatment follow-up relative to baseline; however, our WB only group did not show maintenance of gains. Similar to Carlbring and Smit (2008), we had a dropout rate of approximately 50 %. Thus, both studies lost a large amount of data which could have changed measures of treatment outcomes. It is not known why these individuals dropped out from treatment, whether they benefitted from treatment, or if they returned to gambling.

Our study had a number of limitations. First, we had a dropout rate of about 50 %. It may be that those who continued in treatment differed in some systematic way from those who discontinued treatment. We did test for differences on demographics and background variables between those who completed and those who dropped out; however, it is possible that some other unmeasured variable distinguished between groups (e.g., motivation for treatment). A second limitation was the lack of information about treatment goals. The fact that we were not able to distinguish between those who chose controlled gambling as a goal over those who chose abstinence as a goal means that we could not measure achievement of client-stated treatment goals. We had only the objective measures of any gambling, money spent gambling, and the self-reported gambling symptoms assessed by the G-SAS. Another limitation to this study was the lack of a wait-list or no-treatment control group. Although the work of Hodgins & colleagues identified reductions in gambling for those on a wait-list relative to their baseline, the group receiving a workbook with a motivational intervention had better outcomes than the wait-list control group. The inclusion of a wait-list control would have allowed us to examine the impact of the workbook relative to assessment alone in addition to the impacts of guidance on the dependent variables.

The strengths of the study include the measurement of in-treatment gambling behavior, the wide inclusion criteria, and long-term follow up period. Measurement of in-treatment gambling behavior allowed us to examine the course of change during treatment rather than simply looking at baseline vs. end of treatment. This resulted in a finding about the pace of change during treatment across groups. The use of wide inclusion criteria that did not preclude participation if an individual had a co-occurring disorder means that our sample may be more clinically relevant than those with a more homogeneous, less complicated sample of gamblers. Thus, our findings may be more generalizable to real-world, clinical samples. The 1-year follow up of participants allowed us to examine the durability of changes made during the course of treatment and indicated that many in the WB+G group were able to maintain abstinence after establishing it during treatment.

In summary, the results of this study suggest that using a workbook with therapist guidance may increase the likelihood of achieving abstinence during treatment and maintaining abstinence at 1 year follow up. However, for those who continue to gamble, guidance during use of a self-help workbook does not seem to appreciably alter money spent gambling. For both groups, the workbook was effective in reducing gambling-related symptoms as measured by the G-SAS regardless of therapist guidance; however, this change occurred more rapidly with therapist guidance. Future work should be done to identify the active components of the workbook leading to change, the impacts of motivational interventions in conjunction with workbook and guidance, and methods to sustain in-treatment gains when using brief interventions.

Acknowledgments This research was funded by the CA Office of Problem Gambling, Department of Alcohol and Drug Programs under contract #08-00143.

Conflict of Interest Michael D. Campos, Richard J. Rosenthal, Qiaolin Chen, Jacqueline Moghaddam, and Timothy W. Fong declare that they have no conflict of interest.

Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all patients for being included in the study.

References

- Bien, T. H., Miller, W. R., & Tonigan, J. S. (1993). Brief interventions for alcohol problems: a review. *Addiction*, *88*, 315–336.
- Carlbring, P., & Smit, F. (2008). Randomized trial of internet-delivered self-help with telephone support for pathological gamblers. *Journal of Consulting and Clinical Psychology*, *76*(6), 1090–1094.
- Gerstein, D. R., Volberg, R. A., Toce, M. T., Harwood, H., Palmer, A., Johnson, R., Larison, C., Chuchro, L., Buie, T., Engelman, L., & Hill, M. A. (1999). *Gambling impact and behavior study: Report to the national gambling impact study commission*. Chicago: National Opinion Research Center at the University of Chicago.
- Grant, J. E., Steinberg, M. A., Kim, S. W., Rounsaville, B. J., & Potenza, M. N. (2004). Preliminary validity and reliability testing of a structured clinical interview for pathological gambling. *Psychiatry Research*, *128*(1), 79–88.
- Harris, K. B., & Miller, W. R. (1990). Behavioral self-control training for problem drinkers: components of efficacy. *Psychology of Addictive Behavior*, *4*(2), 82–90.
- Hodgins, D. C., & el-Guebaly, N. (2000). Natural and treatment-assisted recovery from gambling problems: a comparison of resolved and active gamblers. *Addiction*, *95*(5), 777–789.
- Hodgins, D. C., & Makarchuk, K. (2003). Trusting problem gamblers: reliability and validity of self-reported gambling behavior. *Psychology of Addictive Behaviors*, *17*(3), 244–248.
- Hodgins, D. C., Currie, S. R., & el-Guebaly, N. (2001). Motivational enhancement and self-help treatments for problem gamblers. *Journal of Consulting and Clinical Psychology*, *69*(1), 50–57.
- Hodgins, D. C., Currie, S. R., el-Guebaly, N., & Peden, N. (2004). Brief motivational treatment for problem gambling: a 24-month follow-up. *Psychology of Addictive Behaviors*, *18*(3), 293–296.
- Kim, S. W., Grant, J. E., Adson, D. E., & Shin, Y. C. (2001). Double-blind naltrexone and placebo comparison study in the treatment of pathological gambling. *Biological Psychiatry*, *49*, 914–921.
- Kim, S. W., Grant, J. E., Potenza, M. N., Blanco, C., & Hollander, E. (2009). The Gambling Symptom Assessment Scale (G-SAS): a reliability and validity study. *Psychiatric Research*, *166*(1), 76–84.
- Ladouceur, R., Sylvain, C., Boutin, C., Lachance, S., Doucet, C., Leblond, J., & Jacques, C. (2001). Cognitive treatment of pathological gambling. *Journal of Nervous and Mental Diseases*, *189*, 774–780.
- Leclubier, Y., Sheehan, D. V., Weiller, E., Amorim, P., Bonora, I., Sheehan, K. H., Janavs, J., & Dunbar, G. C. (1997). The Mini International Neuropsychiatric Interview (MINI) a short diagnostic structured interview: reliability and validity according to the CIDI. *European Psychiatry*, *12*, 224–231.
- Lesieur, H. R., & Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): a new instrument for the identification of pathological gamblers. *American Journal of Psychiatry*, *144*(9), 1184–1188.
- Lorains, F. K., Cowlishaw, S., & Thomas, S. A. (2011). Prevalence of comorbid disorders in problem and pathological gambling: systematic review and meta-analysis of population surveys. *Addiction*, *106*, 490–498.
- Moyer, A., Finney, J. W., Swearingen, C. E., & Vergun, P. (2002). Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. *Addiction*, *97*, 279–292.
- Pallanti, S., DeCaria, C. M., Grant, J. E., Urpe, M., & Hollander, E. (2005). Reliability and validity of the pathological gambling adaptation of the Yale-Brown Obsessive-Compulsive Scale (PG-YBOCS). *Journal of Gambling Studies*, *21*(4), 431–443.
- Petry, N. M., Stinson, F. S., & Grant, B. F. (2005). Comorbidity of DSM-IV pathological gambling and other psychiatric disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, *66*, 564–574.
- Petry, N. M., Ammerman, Y., Bohl, J., Doersch, A., Gay, H., Kadden, R., Molina, C., & Steinberg, K. (2006). Cognitive behavioral therapy for pathological gamblers. *Journal of Consulting and Clinical Psychology*, *74*(3), 555–567.

- Raylu, N., Oei, T. P. S., & Loo, J. (2008). The current status and future directions of self-help treatments for problem gamblers. *Clinical Psychology Review, 28*, 1372–1385.
- Riper, H., Spek, V., Boon, B., Conijn, B., Kramer, J., Martin-Abello, K., & Smit, F. (2011). Effectiveness of e-self-help interventions for curbing adult problem drinking: a meta-analysis. *Journal of Medical Internet Research, 13*(2), e42. doi:10.2196/jmir.1691.
- Published online 2011 June 30.**
- Roche, A. M., & Freeman, T. (2004). Brief interventions: good in theory but weak in practice. *Drug and Alcohol Review, 23*, 11–18.
- Rockloff, M. J., & Schofield, G. (2004). Factor analysis of barriers to treatment for problem gambling. *Journal of Gambling Studies, 20*(2), 121–126.
- Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., Hergueta, T., Baker, R., & Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry, 59*(suppl. 20), 22–33.
- Slutske, W. S. (2006). Natural recovery and treatment seeking in pathological gambling: results of two U.S. national surveys. *American Journal of Psychiatry, 163*, 297–302.
- Stinchfield, R. (2002). Reliability, validity, and classification accuracy of the South Oaks Gambling Screen (SOGS). *Addictive Behaviors, 27*(1), 1–19.