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Effectiveness of a Self Help Cognitive Behavioural Treatment Program for Problem Gamblers: A Randomised Controlled Trial

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Abstract The study aimed to strengthen the scarce literature on self-help treatments for Problem Gambling (PG) by comparing the effectiveness of a Self-Help Cognitive Behavioral Treatment (SHCBT) program ($n = 23$) with a 6-week Waitlist condition ($n = 32$) in problem gamblers. Participants were community volunteers with gambling problems and were randomly allocated to the Waitlist and treatment conditions. Results showed significant improvements at post-treatment in gambling behaviors including frequency of gambling, average amount gambled per day and PG symptoms as well as a number of gambling correlates including psychological states (e.g., depression, anxiety and stress), gambling cognitions, gambling urges, gambling related self-efficacy, satisfaction with life, and quality of life among those who completed the SHCBT program, when compared with the waitlist condition. The effect size (*partial η^2*) ranged from .25 to .57 for all assessed outcomes that showed significant improvement from pre- to post-treatment. It was concluded that a self-help CBT program can be beneficial for treating community problem gamblers.

Keywords Problem gambling · CBT · Self-help · Depression · Anxiety · Treatment

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Introduction

Cognitive Behavioral Treatment (CBT) of Problem Gambling (PG) has received the most attention in outcomes evaluation and has demonstrated effectiveness in treating gambling problems (Raylu and Oei 2002; Toneatto and Millar 2004; Toneatto and Ladouceur 2003). Most of the studies that have tested the efficacy of CBT for problem gamblers have used a face-to-face treatment format. These studies reported a significant reduction in the frequency of gambling; amount of money spent and desire to gamble following CBT (Oei et al. 2010).

While current literature shows that CBT delivered via face-to-face formats are effective in treating gambling problems, the number of individuals who seek treatment for gambling problems does not mirror the number of problem gamblers in the general population (Evans and Delfabbro 2005). Problem gamblers may not be receiving professional treatment possibly due to shame, guilt, fear of stigma, privacy concerns, financial difficulties, living in rural areas or experiencing less severe gambling problems (Raylu et al. 2008). One way to provide timely assistance is through Self Help Treatment (SHT) programs. SHTs may be an attractive, accessible and cost-effective alternative as it comes in many forms including self-help books, treatment manuals, audiotapes, videotapes, and computer-based SHTs (implemented on palmtop/desktop computers, via a phone or via the Internet).

Meta-analyses of comparisons between SHTs and no treatment controls or therapist-directed interventions have indicated that self-help approaches are more effective than no treatment controls and are not less effective than the same programs administered by therapists (Gould and Clum 1993). The literature has also provided evidence on using SHTs for other psychological conditions such as eating disorders, anxiety and depression problems (Mains and Scogin 2003; Palmer et al. 2002; Grossman et al. 1991; Stefano et al. 2006). Specifically, on addiction, studies have found SHTs to be effective with individuals with substance-related problems (e.g., smoking, drinking alcohol or taking drugs; Papworth 2006; Mains and Scogin 2003; Díez et al. 2002; Cunningham et al. 2001). Most of these SHTs (as cited above) were based on the cognitive-behavioral framework.

While SHTs have garnered support for use with a range of psychological disorders, a review on using self-help therapy for PG by Raylu et al. (2008) showed that cognitive-behavioral SHTs for PG are still in the infant stage of development. There are limited studies that have evaluated the effectiveness of SHTs for PG, with one that assessed the effectiveness of CBT for PGs delivered via the Internet (ref. Carlbring and Smit 2008) and others that assessed the efficacy of self-help manuals/workbooks (ref. Dickerson et al. 1990; Hodgins et al. 2001, 2009; Petry et al. 2006). Although these studies generally supported using cognitive-behavioural self-help manuals/workbooks for treatment with problem gamblers, especially for those whereby clinical contact was minimal, the majority of these studies had some methodological weaknesses.

In particular, the study by Dickerson et al. (1990) was an uncontrolled design with a small ($n = 29$) and predominantly male sample. It also did not assess the effect of treatment on comorbid problems, lacked statistical analyses and failed to use validated measures (Raylu et al. 2008). Although Petry et al. (2006) conducted a randomized control study with a large sample size ($n = 231$) and relatively even gender distribution, it did not have an adequate control condition and had included individuals who attended Gamblers Anonymous in all treatment conditions. The studies conducted by Hodgins et al. (2001, 2009) were the only ones that had robust methodologies. In their studies, Hodgins et al. (2001, 2009) included large sample sizes ($n = 102$ and 314, respectively), a more even gender distribution, random control conditions (i.e., 1 month and 6-week waitlist

conditions, respectively), statistical analyses and validated measures. However, the effect sizes of these studies were generally slightly less than the overall effect size found in the meta-analyses of treatment studies on problem gamblers by Pallesen et al. (2005). The meta-analyses by Pallesen et al. (2005) included the works of Hodgins et al. (2001, 2004), which also highlighted a number of face-to-face psychological treatments for PG. Thus, considering the above limitations, this study aimed to strengthen the scarce literature on self-help interventions for PG by comparing the effectiveness of a Self-Help CBT (SHCBT) program with a 6-week Waitlist condition among problem gamblers. It was hypothesized that participants receiving SHCBT would significantly reduce their gambling behaviors, problem gambling symptoms as well as a number of gambling correlates (i.e., psychological states, gambling cognitions, gambling urges, gambling related self-efficacy, satisfaction with life, and quality of life) as compared those in the waitlist condition.

Method

Participants

Participants were individuals who volunteered to participate in a SHCBT program to treat their gambling problems. They were recruited from advertisements on radio, newspaper articles and a 24-h problem gambling helpline. Participants were recruited from regions across Queensland with an aim to target both rural and urban areas. The inclusion criteria included: (a) willingness to be randomly assigned to one of the treatment conditions or a waitlist condition for 6 weeks prior to commencing one of the treatments; (b) willingness to complete and return a number of questionnaires at the beginning and end of the treatment program; and (c) over 18 years of age. The study also had a number of exclusion criteria. These included: (a) suicidal ideation; (b) involvement in legal proceedings requiring documentation of treatment; (c) already undergoing specific gambling treatment; (d) receiving treatment for other psychological and psychiatric problems that may impact on the study (e.g. severe psychiatric co-morbidity, schizophrenia, and mania); and (e) adequate proficiency in English.

At the start of the study, 110 participants were allocated randomly (after initial telephone interview) to either a 6-week Waitlist condition (WL; $n = 48$) or a SHCBT condition (SHCBT; $n = 62$) and completed the pre-treatment questionnaires prior to commencing the SHCBT program or waitlist period. Subsequently, 32 out of 48 allocated participants completed the WL condition and 23 out of 62 allocated participants completed the SHCBT condition. Participants in the WL condition received the SHCBT program after the 6-week wait period. Out of these participants who completed their allocated treatment respectively, 8 WL participants and 23 SHCBT participants provided post-treatment (i.e., after completion of SHCBT) data in full.

Of the 32 participants in the WL condition, 46.9% were males and 53.1% were females. Mean age of the participants in the WL condition was 48.97 ($SD = 13.04$; age range = 22–75 years). Of the 23 participants in the SHCBT condition, 52.2% were males and 47.8% were females. Mean age of the participants was 49.78 ($SD = 15.07$; age range = 17–78 years). Further demographic information (i.e., ethnicity, residency, income, educational level, employment and marital status) are summarized in Table 1.

Table 1 Demographical characteristics of participants in self help CBT and Waitlist conditions

	Self-help CBT (N = 23)	WL (N = 32)	Total (N = 55)
Age, M (SD)	49.78 (15.07)	48.97 (13.04)	49.38 (14.06)
Gender			
Male	12 (52.2%)	15 (46.9%)	27 (49.1%)
Female	11 (47.8%)	17 (53.1%)	28 (50.9%)
Ethnicity			
Caucasian	20 (86.4%)	28 (87.4%)	48 (87.3%)
Non-caucasians	3 (13%)	4 (7.4%)	7 (12.7%)
Born in Australia	16 (69.6%)	21 (65.6%)	6 (67.3%)
Income (per annum)			
< $20,000	8 (34.8%)	6 (18.7%)	14 (25.9%)
$20,000–$40,000	4 (17.4%)	10 (31.3%)	14 (25.5%)
$40,000–$60,000	4 (17.4%)	8 (25%)	12 (21.8%)
> $60,000	7 (30.4%)	8 (25%)	15 (27.3%)
Education			
Primary	1 (4.3%)	1 (3.1%)	2 (3.63%)
Secondary	10 (43.4%)	17 (53.1%)	27 (49.1%)
Certificate/diploma	6 (26.2%)	5 (15.6%)	11 (20%)
Bachelor/higher degree	6 (26.1%)	9 (28.2%)	15 (27.3%)
Employment			
Full-time	11 (47.8%)	17 (53.1%)	28 (50.9%)
Part-time	2 (8.7%)	6 (18.8%)	8 (14.5%)
Full-time student	1 (4.3%)	0	1 (4.3%)
Retired	4 (17.4%)	5 (15.5%)	9 (16.4%)
Looking for work	1 (4.3%)	2 (6.3%)	3 (5.5%)
On benefit	4 (17.5%)	2 (6.3%)	6 (10.9%)
Marital status			
Single	5 (21.7%)	7 (22.6%)	12 (21.8%)
Married/in a relationship	7 (30.3%)	18 (54.8%)	25 (45.5%)
Divorced/separated	10 (43.6%)	7 (22.6%)	17 (30.9%)
Widowed	1 (4.4%)	0	1 (4.4%)

Measures

Canadian Problem Gambling Index—short form (*CPGI;* Ferris and Wynne 2001) The CPGI is a 31-item assessment of pathological gambling. Participants are rated on a four-point Likert scale (0 = Never, 1 = Sometimes, 2 = Most of the time, and 3 = Almost always), with total scores of (1) zero being identified as non-PGs, (2) 1–2 as low risk gamblers, (3) 3–7 as moderate gamblers and (4) 8–27 as PGs. The CPGI has shown to have good internal consistency (α = .84) and good criterion-related validity (r = .83) with the Diagnostic Statistical Manual IV (DSM-IV; American Psychiatric Association 1994).

Gambling Related Cognitions Scale (*GRCS;* Raylu and Oei 2004a) The GRCS is a 23-item questionnaire for assessing a range of gambling-related cognitions categorised under five sub-domains: Interpretative Control/Bias (GRCS-IB), Illusion of Control (GRCS-IC), Predictive Control (GRCS-PC), Gambling-related Expectancies (GRCS-GE) and Perceived Inability to Stop gambling (GRCS-IS). Participants are required to use a seven-point Likert scale, ranging from one (strongly disagree) to seven (strongly agree), with higher scores indicating higher levels of gambling-related cognitive errors. The scale has high internal consistency ($\alpha = .93$) and good discriminant validity as the scale can discriminate between non problem gamblers and problem gamblers ($\Lambda = .88$, $\chi^2 = 185$, $p < .001$; Raylu and Oei 2004a).

Gambling Urge Scale (*GUS;* Raylu and Oei 2004b) The GUS is a six-item measure for screening gambling urges. Participants are required to use a seven-point semantic differential scale to indicate how much they agree or disagree to each statement based how they were thinking or feeling as they were completing the GUS. The scale has high internal consistency ($\alpha = .81$) and good discriminant validity as the scale can discriminate between non problem gamblers and problem gamblers ($\Lambda = .83$, $\chi^2 = 130$, $p < .001$; Raylu and Oei 2004b).

The Depression Anxiety Stress Scale-21 (*DASS;* Lovibond and Lovibond 1995) The DASS-21 is a 21-item self-report questionnaire measuring levels of depression (DASS-D), anxiety (DASS-A), and stress (DASS-S). Participants are required to use a four-point Likert scale (0 = Did not apply to me at all, 1 = Applied to me to some degree, or some of the time, 2 = Applied to me to a considerable degree, or a good part of the time, and 4 = Applied to me very much, or most of the time), with higher scores indicating higher levels of depression, anxiety and stress. The DASS has high internal consistency (i.e., Cronbach's alphas of .94, .87, and .91 for the depression, anxiety, and stress subscales, respectively; Antony et al. 1998) and shown to have high concurrent validity ($r = .84$).

Gambling Refusal Self-Efficacy Questionnaire (*GRSEQ;* Casey et al. 2008) is a 31-item questionnaire that assesses the respondent's level of confidence in refusing to gamble based on 4 subdomains contextualized to Situations/Thoughts (GRSEQ-ST), Drugs (GRSEQ-DR), Positive Emotions (GRSEQ-PE) and Negative Emotions (GRSEQ-NE). Participants are required to use a 11-point Likert scale, which ranges from zero (No confidence, cannot refuse) to 100 (Extreme confidence, certain can refuse) to indicate how sure they are that they could refuse to gamble in four circumstances (subscales). The GRSEQ-T and subscale scores have shown to have high internal consistency (Cronbach's alpha ranging from .92 to .98; Casey et al. 2008). GRSEQ subscales also demonstrated good criterion-related validity with SOGS (significant negative *r* ranging from .56 to .83; Casey et al. 2008).

Satisfaction with Life Scale (*SWLS*—Diener et al. 1985) The SWLS is a 5-item measure that assesses global life satisfaction. Participants are required to use a seven-point Likert scale, ranging from one (strongly disagree) to seven (strongly agree), with high scores reflecting high level of life satisfaction. The tool has good internal consistency ($\alpha = .82$) and good convergent validity with other measures of subjective well being, $r \geq .50$ (Pavot and Diener 1993).

Alcohol Use Disorders Identification Test (*AUDIT*—Saunders et al. 1993) The AUDIT is a 10-item questionnaire for evaluating if an individual's alcohol consumption is harmful or hazardous. Participants are required to indicate their alcohol consumption frequencies, ranging on a scale of zero (e.g., never drinks) to four (e.g., four times a week), with a score of (1) eight or more for males and seven for females indicating a strong likelihood of hazardous or harmful alcohol consumption and (2) score of more than 20 suggesting alcohol dependence. The AUDIT has been found to have high test–retest reliability

($r = .86$; Sinclair et al. 1992). Bohn et al. (1995a, b) found that the scale had strong convergent validity ($r = .88$) when compared to other alcohol consumption screening tools.

World Health Organisation Quality of Life—bref (*WHOQOL-bref,* The WHOQOL Group 1998) The WHOQOL-bref is a 26-item version of the WHOQOL-100 questionnaire that assesses changes in the quality of life in the last 4 weeks based on subscales of Physical Health (WHOQOL-PH), Psychological Well-Being (WHOQOL-PW), Social Relationships (WHOQOL-SR) and Environment (WHOQOL-BE). Participants are required to respond on a five-point Likert scale, which ranges from one (e.g., very poor, very dissatisfied, or not at all) to five (e.g., very good, very satisfied, extreme amount, or completely). The WHOQOL-bref has been found to have good internal consistency for all of its domains (alpha coefficient > .60; Skevington et al. 2004). The questionnaire also showed good discriminant validity (Skevington et al. 2004).

In addition, all participants were asked about the frequency and amount spent on gambling per day on various games (i.e., gambling machines, table games, animals and other forms of gambling) using an eight-item questionnaire developed by the researchers. Four of the items asked participants to indicate how often they gamble on various games using an ordinal scale (i.e., never, monthly or less, two to four times a month, two to three times per week and four or more times per week). The other four items asked participants to indicate on average how much they gamble daily on various games.
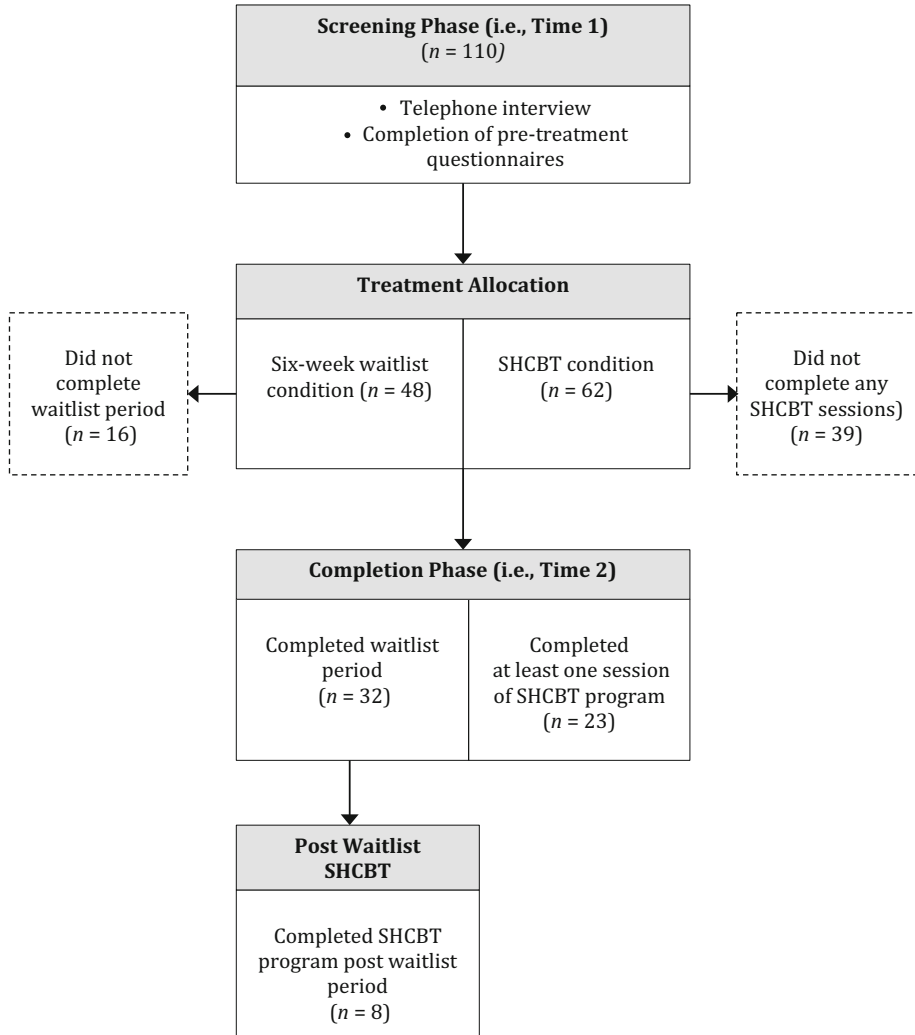
Procedures

All participants in this study completed a set of questionnaires at pre-treatment and post treatment. They were mailed the set of questionnaires at the two assessment points and asked to return them to the researchers in stamped, addressed envelopes. All participants were provided the battery of questionnaires in the same order.

Participants in the treatment condition were required to complete a self-help CBT manual specially designed for problem gamblers (Oei et al. 2008). The SHCBT manual included components that have been normally included in other CBT programs reported in the literature including, cognitive correction of erroneous perceptions about gambling and problem gambling, problem-solving skills training and relapse prevention. The seven-session self-help manual also contained practical tasks to be carried out to assist in consolidating the cognitive behavioral skills into the participants' real lives. It also contained additional readings, self-monitoring forms, and self-evaluated adherence forms for each week.

When participants received the manual via the mail, they were asked to read each chapter/session (up to seven chapters/sessions), on a weekly basis over 7 weeks. After completing a session/chapter, participants were required to complete the activities/exercises at the end of the chapter. These activities/exercises were then torn out of the manual along the perforated edge of the pages and sent back in reply-paid envelopes. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

The study procedures for each condition are presented in Fig. 1.

Fig. 1 Study procedures for self-help CBT (SHCBT) participants and participants in the waitlist conditions

Data Analyses

Missing pre-treatment and post treatment data (e.g., one to three unanswered item(s) per questionnaire) were replaced with means (Tabachnik and Fidel 2001). Data were explored using Statistical Package for the Social Sciences 21 to ensure all relevant statistical assumptions were met. A series of repeated measures General Linear Modeling (GLM) analyses were conducted to compare (1) between SHCBT completers and dropouts, and (2) between SHCBT and waitlist conditions, from Time 1 (i.e., T1; prior to commencing SHCBT or 6-week wait period) to Time 2 (i.e., T2; after completing SHCBT or 6-week wait period) on several dependent variables, which included gambling behaviors (i.e., frequency of gambling and the average amount gambled per day), gambling related self-

efficacy (GRSEQ-T and subscale scores), psychological states (DASS-T and subscale scores), gambling cognitions (GRCS-T and subscale scores), gambling urges (GUS-T score), satisfaction with life (SWLS-T score) and quality of life (total and subscale WHOQOL scores). Multivariate Analysis of Variance (MANOVA) statistical methods were employed to test for between- and within-group differences for specific dependent variables.

Eventually, the analyses were conducted with 23 participants, which included 17 participants who completed four or more sessions and six participants who completed less than four sessions. The study included participants who completed at least one session of treatment for two reasons. First, pre-analyses of pre- and post-treatment data showed improvement patterns were similar for those who completed four or more sessions and those who completed less than four sessions. Second, both the gambling (Hodgins et al. 2009; Petry et al. 2008, 2009) and general addiction (Martínez et al. 2008; Martínez Martínez et al. 2008; Rothman 2009) literature showed that only one or a few sessions of intervention can in fact lead to improvement of the problem behaviour and its correlates.

Effect sizes (partial η^2) between pre-treatment (T1) and post-treatment scores, and between pre-waitlist (T1) and post-waitlist (T2) scores, were also reported to show the proportion of variance that was accounted for by an effect. Stevens reported that the effect size values for partial η^2 are regarded as small at .01, medium at .06 and large at .14. As many comparisons were done, Bonforonni adjustment was used (to protect against Type I error) and thus, alpha of .01 was used for all analyses in this study.

Results

Comparisons Between SHCBT Completers and SHCBT Dropouts

Chi square analyses were conducted to examine whether SHCBT completers differed from SHCBT dropouts in socio-demographics and medical and psychiatric history. As seen in Table 1, Chi square goodness-of-fit tests revealed no significant differences between SHCBT completers and dropouts in socio-demographics (i.e., gender, income, education, marital status, employment, ethnicity, birth country, current residing country, religion), presence of past brain injury and any comorbid psychiatric disorders, and use of other substances.

A one-way MANOVA was also conducted to examine differences between SHCBT completers and dropouts in gambling urge ratings, gambling behaviours, psychological states and perspectives on SHCBT homework (i.e., clarity and difficulty of SHCBT homework). Multivariate tests of group means did not reach statistical significance, Hotelling's Trace = .16, $F(4, 13)$ = .53, ηp^2 = .14. Specifically, SHCBT completers did not differ significantly from SHCBT dropouts in gambling urge ratings [M(completers) = 8.82; M(dropout) = 7.00], amount of money gambled [M(completers) = 15.88; M(dropouts) = 40.00], amount of money lost [M(completers) = 7.65; M(dropouts) = 0.00] and psychological states [M(completers) = 10.71; M(dropouts) = 9.00].

Results from Chi square and multivariate analyses suggest no significant differences between SHCBT completers and dropouts in socio-demographic variables, medical and psychiatric history, gambling urge and behaviours and psychological states. This implies

that the SHCBT completers were homogenous with those who eventually dropped out of the program.

Comparisons Between SHCBT and WL Conditions

For participants in the WL condition, repeated measures GLM analyses showed that for most of the assessed dependent variables, there were no significant differences between pre- and post-waitlist scores. After adjusting for Bonferroni corrections, only GRCS-IS remained significant. GRCS-IS scores at T1 were slightly higher than GRCS-IS scores at T2. Descriptive statistics and effect sizes of these analyses are also shown in Table 2. As

Table 2 Means and standard deviations of the dependent variables at pre- and post- treatment (including results of the GLM analyses)

| | SHCBT | | WL | |
| | Pre-treatment | Post treatment | Post treatment | Effect size (partial η^2) |
Variables	M (SD)	M (SD)	M (SD)	Time
Gambling frequency***	6.87 (3.02)	2.61 (2.04)	5.16 (2.03)	.56
Average amount gambled per day	$753.22 ($1159.79)	$364.96 ($1133.10)	$313.24 ($401.12)	.32
CPGI-T**	16.04 (6.95)	11.09 (8.41)	18.53 (4.79)	.30
GUS-T***	23.53 (12.95)	10.41 (6.88)	21.53 (10.32)	.57
GRCS-T ***	87.48 (27.10)	51.30 (28.31)	80.19 (26.09)	.45
GRCS-GE***	17.83 (4.99)	10.22 (5.98)	17.03 (5.34)	.52
GRCS-IC**	12.00 (7.26)	6.57 (4.66)	8.97 (5.29)	.39
GRCS-PC	18.13 (7.21)	11.83 (7.70)	16.53 (6.84)	.25
GRCS-IS**	22.13 (8.90)	12.39 (8.86)	22.50 (7.99)	.42
GRCS-IB**	17.39 (6.16)	10.30 (7.31)	15.03 (6.50)	.39
GRSEQ-T	135.20 (105.84)	264.08 (128.37)	151.80 (80.01)	.36
GRSEQ-ST**	26.81 (25.86)	62.55 (30.66)	28.49 (19.20)	.40
GRSEQ-DR	33.14 (31.10)	66.19 (34.04)	40.24 (34.37)	.39
GRSEQ-PE	35.67 (31.63)	68.56 (36.56)	45.40 (27.98)	.30
GRSEQ-NE	37.78 (32.01)	66.00 (37.72)	36.15 (27.73)	.26
DASS-T***	60.10 (31.68)	30.48 (33.59)	56.90 (31.50)	.47
DASS-D**	23.82 (12.72)	12.64 (14.82)	22.26 (11.58)	.38
DASS-A**	12.86 (10.29)	5.52 (9.51)	12.71 (12.05)	.34
DASS-S**	23.91 (11.34)	14.64 (12.89)	21.94 (10.33)	.37
WHOQOL-T	71.59 (17.18)	80.29 (21.47)	76.63 (12.54)	.28
WHOQOL-PH**	23.18 (5.56)	26.00 (6.07)	24.42 (4.10)	.39
WHOQOL-PW	15.41 (5.15)	19.18 (7.13)	16.53 (4.67)	.32
WHOQOL-SR	7.47 (2.81)	7.65 (3.14)	7.72 (3.10)	.01
WHOQOL-BE	25.53 (6.46)	27.47 (7.19)	28.45 (4.64)	.14
SWLS**	12.53 (7.48)	17.29 (8.71)	14.87 (6.58)	.43

*** $p < .001$; ** $p < .01$

Table 2 shows, the effect size (partial η^2) for comparisons between pre- and post-waitlist scores was .42 for dependent variable GRCS-IS. These results suggest that waitlist participants did not improve on most of the dependent variables over the natural course of time, except in their perceived ability to stop gambling.
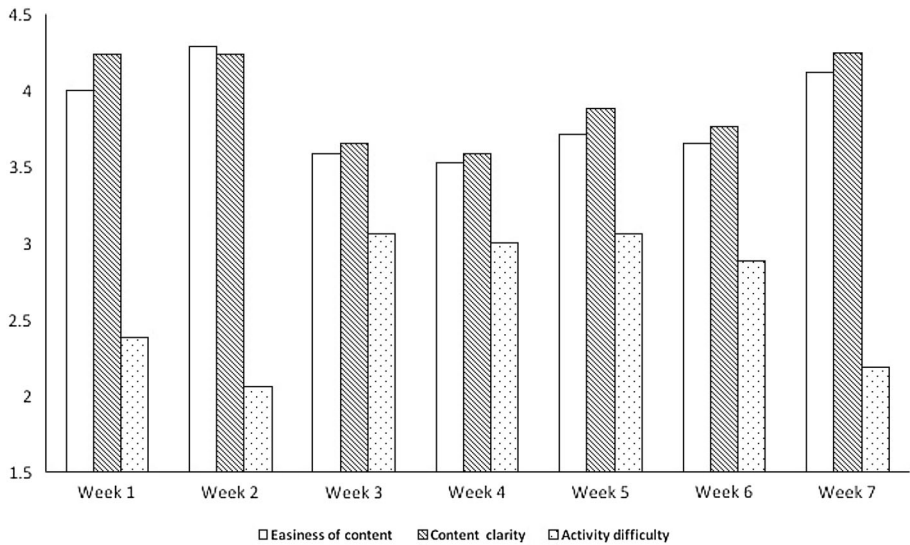
For participants who completed the SHCBT condition, repeated measures analyses showed that there were significant differences between pre- and post-treatment scores for most of the assessed dependent variables, except WHOQOL-SR, $F(1,16) = .11$, *ns* and WHOQOL-BE, $F(1,16) = .25$, *ns* subscales (refer to Table 2 for the results of the analyses). For all the significant variables, the post-treatment scores were higher than the pre-treatment (T1) scores. However, after adjusting for the Bonferroni corrections, some of the variables were insignificant such as GRCS-PC, WHOQOL-T, WHOQOL-PW, average amount gambled per day and the GRSEQ total and subscale scores (except GRSEQ-ST; refer to Table 2). As Table 2 shows, the effect sizes (partial η^2) between pre- and post-treatment scores ranged from .25 to .57 for most of the variables (except WHOQOL-SR and WHOQOL-BE), showing that the effect sizes for these were above the cutoff for high effect size (i.e., .14). The effect sizes for WHOQOL-SR and WHOQOL-BE were .01 and .14, respectively. These results suggest that SHCBT completers improved in gambling frequency, amount gambled, gambling urge, gambling-related cognitions, gambling-related self-efficacy in relation to situations and thoughts, psychological states and quality of life in terms of physical health and life satisfaction ratings.

Feedback on Using Treatment Manual Among SHCBT Participants

Self-Help CBT participants also rated on the clarity and ease of understanding SHCBT manual content and perceived difficulty level in completing manual activities over the course of treatment period (i.e., 7 weeks). A one-way repeated ANOVA revealed statistically significant differences in SHCBT completers' rating on perceived easiness in understanding manual content over time, Wilks' Lambda = .32, $F(6, 11) = 3.94$, $\eta p^2 = .68$. In particular, SHCBT completers' ratings on perceived easiness in week 2 was significantly higher than that in week 6 (refer to Fig. 2). Although differences in ratings of perceived easiness between other weeks were not statistically significant, a U-shaped graph depicting participants' ratings was observed with the highest level of perceived easiness at week 2, followed by a sharp dip in week 3 and a steady climb from week 4 to week 7. Moreover, SHCBT completers did not report statistically significant differences in the (1) clarity of manual information, Wilks' Lambda = .42, $F(6, 11) = 2.49$, $\eta p^2 = .58$ and (2) difficulty level of manual activities, Wilks' Lambda = .47, $F(6, 10) = 1.91$, $\eta p^2 = .53$, over time. These observations suggest that SHCBT completers likely felt more challenged by manual content (instead of manual activities or content clarity), especially in the middle phase of Self-Help CBT (i.e., week 3 to week 5, but was able to gain better mastery of manual materials towards the end of the treatment phase.

Discussion

The present results showed significant improvements from pre to post treatment in gambling outcomes, including gambling frequency, amount gambled and PG symptom severity (assessed by the CPGI), among those who completed the SHCBT condition. Participants

Fig. 2 Feedback on ease of understanding and clarity of manual content and difficulty in completing manual activities among SHCBT completers

who completed SHCBT condition reported less gambling behaviors and PG symptoms than participants in the waitlist condition after the 6-week waitlist period.

For SHCBT completers, improvements were also found at post-treatment for a number of gambling correlates, including psychological states, gambling-related cognitions, gambling urges, life satisfaction and gambling self-efficacy in high risk situations. In contrast, for participants who completed the 6-week waitlist condition, most of these variables remained unchanged. Effect sizes for the SHCBT condition were generally above the cutoff for high effect size (i.e., .14). It is to note that study participants were randomly assigned to the treatment and waitlist conditions. Thus, results from this study provide further evidence to support the efficacy of SHT programs in the remediation of PG symptoms and gambling correlates (e.g., negative mood), in addition to existing literature that have demonstrated the effectiveness of face-to-face CBT (e.g., Ladouceur et al. 2001, 2003; Oei et al. 2010) or self-help CBT (e.g., Hodgins et al. 2001, 2004) for gambling behaviors and PG symptoms.

The positive findings for the SHCBT condition were found even though the analyses included both participants who completed four or more sessions as well as those who completed less than four sessions. This is consistent with previous gambling literature (Hodgins et al. 2009; Petry et al. 2008, 2009) and general addiction literature (Martínez et al. 2008; Rothman 2009), which observed that only one or a few sessions of intervention can in fact lead to improvement in gambling behaviours and correlates. Many of the studies that have explored the efficacy of brief interventions with gambling problems and other addictive problems have generally included motivational interviewing techniques in their brief interventions. The first two workbooks of the self-help CBT program used in this study included numerous motivational interviewing techniques including psycho-education and goal setting.

These results were also supported by preliminary findings on unsolicited feedback from participants who completed the self-help CBT. For example, SHCBT participants did not

report experiencing significant difficulties in completing manual activities. SHCBT participants also reflected that manual contents became easier to understand towards the end of treatment, following a period of perceived difficulty in understanding manual content during the middle phase of treatment. The feedback suggested that SHCBT participants possibly gained mastery in using treatment materials over time. Although feedback from study participants were positive and did not contain any complaints, conclusions from unsolicited testimonials are to be interpreted with caution in view of possible social desirability bias from study participants. Nonetheless, qualitative feedback that could be useful in gaining perspectives on user experiences is an option to explore in future studies evaluating SHTs, and that future studies may collect feedback about self-help programs anonymously to further inform utility of SHT programs for individuals with PG.

There are a number of clinical implications for these findings. First, self-help treatment for problem gamblers in the format such as that used in this study can be considered for gamblers who are keen to seek treatment. This may be especially helpful for PG intervention clinics with a long waiting list or shortage of skilled clinicians. They would also be appropriate for use in primary care settings such as by general practitioners. If treatment-seeking PG clients with less severe problems, better insight, less comorbid issues and better motivation have convenient access to self-help treatments, clinicians may then be able to divert resources and efforts to treating clients with more complex gambling problems (Mataix-Cols and Marks 2006). Supporting this further, the current study also showed that self-help CBT programs could be understood and processed by treatment participants fairly easily and without significant barriers to activity completion. Second, self-help treatments can also be ideal for individuals needing treatment for gambling problems, but are less keen to seek professional face-to-face treatment. This includes (1) particular demographic groups (e.g., ethnic minorities, youth, or elderly), (2) gamblers who feel guilty or shameful about seeking face-to-face treatment or who have financial problems, and (3) gamblers that live in areas where professional assistance is lacking and those at an earlier stage of gambling problem. In our study, participants reported that they reside in various parts of Queensland. Therefore, recalling the positive comments from unsolicited participant testimonials, SHTs such as that used in this study may be an important resource for problem gamblers or family of individuals seeking PG treatments when professional help is not readily available in the vicinity of their residence.

There were some limitations for this study. Firstly, follow-up assessment of treatment outcomes was not pursued. A follow-up evaluation of treatment outcomes for SHCBT completers would be have provided meaningful literature on the sustainability of treatment gains in self-help programs for addictive problems. Secondly, a majority of the study sample was of Caucasian race. Previous research has highlighted differences in gambling behaviours between cultural groups (Loo et al. 2008; Raylu and Oei 2002; GAMECS Project 1999). In particular, PG rates were observed to be higher among Chinese gamblers in Australia and Hong Kong as compared to Caucasian samples (Blaszczynski et al. 1998; Loo et al. 2008). Therefore, findings from present study could be extended further to examine the efficacy of SHT programs across a range of problem gambler profiles including the effects of Finally, as participants volunteered for the study, the sample could have contained mostly motivated clients. However, Chi square analyses between SHCBT completers and dropouts did not reveal any significant differences across a range of variables covering socio-demographics and medical and psychiatric history. Although participant motivation is unlikely to be a limiting factor in the present study, this is an aspect to be considered for future studies evaluating SHT programs for PG.

The present study provided promising results to the use of self-help treatments for individuals experiencing gambling problems. To further strengthen the literature on PG self-help programs, future studies could compare the efficacy of PG self-help treatment manuals with other forms of treatment for problem gamblers (e.g., face to face treatments or pharmacotherapy) as well as other forms of SHTs (e.g., Internet based SHTs). Future studies also need to assess whether additional single or multiple telephone contact or counseling sessions by a clinician can improve outcome of self-help treatments for problem gamblers (Raylu et al. 2008). Future studies also need to assess how important variables such as client motivation, family variables, comorbidity and personality could impact outcomes of SHT programs for PG.

In summary, the results of the present study provided preliminary evidence that a self-help CBT program can significantly improve PG behaviors as well as a number of gambling correlates.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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