

# Randomized Trial of Internet-Delivered Self-Help With Telephone Support for Pathological Gamblers

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Although effective therapies for pathological gambling exist, their uptake is limited to 10% of the target population. To lower the barriers for help seeking, the authors tested an online alternative in a randomized trial ( $N = 66$ ). The participants were pathological gamblers not presenting with severe comorbid depression. A wait-list control was compared with an 8-week Internet-based cognitive behavior therapy program with minimal therapist contact via e-mail and weekly telephone calls of less than 15 min. Average time spent on each participant, including phone conversations, e-mail, and administration, was 4 hr. The Internet-based intervention resulted in favorable changes in pathological gambling, anxiety, depression, and quality of life. Composite between-group effect size (Cohen's  $d$ ) at posttreatment was 0.83. Follow-ups carried out in the treatment group at 6, 18, and 36 months indicated that treatment effects were sustained ( $d$ s = 2.58, 1.96, and 1.98). This evidence is in support of Internet-delivered treatment for pathological gamblers. However, it is not clear how effective the treatment is for more severely depressed individuals.

*Keywords:* gambling, depression, anxiety, quality of life, Internet-based treatment

There is evidence suggesting that the proliferation of gaming increases the prevalence of pathological gambling (Götestam & Johansson, 2003). Although there are effective psychosocial treatments (Pallesen, Mitsem, Kvale, Johnsen, & Molde, 2005), only about 10% of pathological gamblers seek treatment (Ladouceur, 2005). Apart from a shortage of skilled therapists, long waiting lists, and the cost factor, fear of stigma may prevent many pathological gamblers from seeking therapy (Evans & Delfabbro, 2005). Consequently, a major challenge is to increase the accessibility and affordability of evidence-based psychological treatments for pathological gambling.

A novel and promising approach is cognitive behavior therapy (CBT) delivered as Internet-based self-help with minimal therapist contact (Carlbring & Andersson, 2006). Although results show potential for depressive and anxiety disorders (Spek et al., 2007),

the effects cannot be directly transferred to pathological gambling because gamblers often drop out of treatment (Melville, Casey, & Kavanaugh, 2007; Wulfert, Blanchard, Freidenberg, & Martell, 2006). Notwithstanding the dropout rates, there is evidence that self-help (bibliotherapy) is effective relative to a waiting list (Hodgins, Currie, & El-Guebal, 2001; Hodgins, Currie, el-Guebal, & Peden, 2004).

Because pathological gambling is associated with an elevated risk for suicide, we included only gamblers with mild-to-moderate levels of depression (cf. Newman & Thompson, 2007). This trial compared Internet-administered self-help that included minimal therapist contact via e-mail with a wait-list condition. To maximize compliance, we supplemented the treatment with short weekly telephone calls (cf. Carlbring et al., 2006; Carlbring, Gunnarsdotir, et al., 2007).

## Method

### Design

Participants were randomly allocated to the conditions by an online, true-random-number service independent of the investigators and therapists. Self-report measurements were taken at baseline and at 3 months in both conditions and at 6, 18, and 36 months in only the experimental condition to monitor effect maintenance. At 18 and 36 months, an independent clinician, blind to treatment status, conducted clinical global impression interviews over the telephone. The study protocol was approved by a medical ethics committee, and written informed consent was obtained from the participants.

### Participants and Procedures

We used media announcements with the headings "Do you have trouble controlling your gambling" and "Do you want to stop

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gambling” to recruit participants. Selection took place with a computerized screening interview consisting of the National Opinion Research Center *DSM* Screen for Gambling Problems (NODS; Gerstein et al., 1999), the self-rated version of the Montgomery-Åsberg Depression Rating Scale (MADRS; Svanborg & Åsberg, 1994), and 71 additional questions regarding gambling activities and demographics.

To be included in the study, participants had to meet the following criteria: (a) fulfill the criteria of the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000) for pathological gambling, according to the 1-month version of the NODS; (b) have a total score of <21 on the MADRS depression scale and of <4 on the suicide item; (c) be at least 18 years of age; (d) live in Sweden; and (e) have gambled at least once in the past 30 days.

Of the 224 individuals who applied from August 2004 through April 2005, 66 fulfilled the criteria. The reasons for exclusion are specified in the CONSORT flowchart (see Figure 1). The mean age of the 66 participants (94% male) was 31.9 years ( $SD = 9.8$ ; range, 18–57 years), and the mean age of onset of regular gambling was 23.2 years ( $SD = 9.5$ ). The duration of pathological gambling was  $M = 5.2$  years ( $SD = 4.2$ ). During the past month, participants had gambled on average 4.2 ( $SD = 1.6$ ) days per week and had spent on average 3.4 hr ( $SD = 2.6$ ) on each occasion. A

majority had a gambling debt (62%); the average sum was \$20,875 ( $SD = \$48,443$ , median = \$7,138). The main culprits were video lottery terminals (36.4 %), Internet poker (21.2 %), sports betting (12.1 %), and horses (10.6 %).

### Treatment

The treatment was based on established CBT methods, as described in self-help books (Hodgins, 2002; Ladouceur & Lachance, 2006). The text was divided into eight modules and was adapted for Internet use. The first four modules had a motivational interviewing focus and included building motivation for change by letting the participant answer open-ended questions that would evoke talk of change. The participants were encouraged to ask for input from their relatives on different aspects of their gambling. In addition, the first four modules included time line follow-back and mapping of the reasons for gambling. The remaining four modules were based on CBT.

Each module included information and exercises and ended with three to eight essay-style questions. Participants were asked to answer the questions, provide their worksheets, and report on outcomes of different exercises. For each module, they were required to post at least one message in an online discussion group about a predetermined topic.

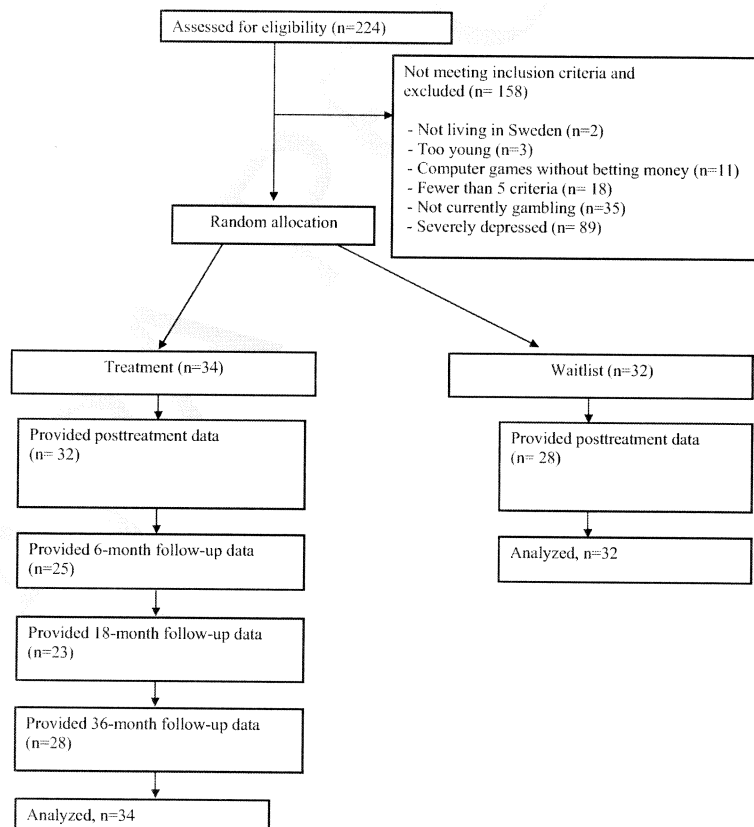


Figure 1. CONSORT flowchart of study participants, point of random assignment, and dropouts at each stage of a study of Internet-delivered self-help with telephone support for pathological gamblers.

Feedback on homework assignments was usually given within 24 hr after participants had sent their answers via e-mail. Once weekly, a telephone call was made by the therapists to each participant. The purpose was to provide positive feedback and encouragement as well as to answer any questions of the participant about the modules. Each conversation lasted approximately 15 min, and a mean total of 7.5 ( $SD = 1.7$ ) calls was made during the 8 weeks.

The therapists were two social workers with an additional 2 years of basic training in CBT and motivational interviewing (MI). Both therapists had good MI skills according to the MI Treatment Integrity Code (Forsberg, Källmen, Hermansson, Berman, & Helgason, 2007). In addition, they had daily contact with anonymous gamblers when they gave telephone support on the Swedish national gambling helpline. The mean total time per week spent on each participant in this study was approximately 30 min and included telephone calls, administration, and response to e-mails. A clinical interview and the NODS, modified to assess gambling at 1 month instead of 1 year, constituted the primary outcome measures. Use of the NODS instead of the more widely used South Oaks Gambling Screen (Lesieur & Blume, 1987) was motivated by the fact that the NODS is based on *DSM-IV* rather than *DSM-III* criteria. Furthermore, the NODS has been reported to show promise as an outcome measure of gambling (Hodgins, 2004).

In addition, the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) and the Quality of Life Inventory (QOLI; Frisch, Cornell, Villanueva, & Retzlaff, 1992) were used as secondary outcome measures. The outcome measures have good psychometric properties, even when administered via the Internet (Andersson, Kaldo-Sandström, Ström, & Strömgen, 2003; Carlbring, Brunt, et al., 2007).

Participants were contacted by an independent clinician at 18 and 36 months, and a clinical global impression of improvement was mapped on a 4-point scale (Guy, 1976) after a telephone interview. The interview was based on the Structured Clinical Interview for Pathological Gambling (Grant, Steinberg, Kim, Rounsaville, & Potenza, 2004), adapted for Swedish use.

### Analysis

Two different approaches were employed for the main analysis. The first used *t* tests with imputation according to the last-observation-carried-forward method in case of missing data. The second approach employed a random effects model, which is not sensitive to missing data (Gueorguieva & Krystal, 2004). Finally, in the treatment group, the follow-up measurements were compared with the baseline scores, with the *t* test for paired observations used in order to evaluate effect maintenance.

### Results

Table 1 shows that randomization resulted in a balanced distribution across both conditions; all  $ts(65) < 1.08$ , all  $ps > .28$ . Fifty percent of participants completed all 8 modules within the intended 8-week period ( $M = 6.15$ ,  $SD = 2.4$ ). After 8 weeks, participants were given access to the rest of the program; at 6-month follow-up, the corresponding figure was 68% ( $M = 6.79$ ,  $SD = 2.2$ ). In the experimental condition, gambling-related problems were significantly reduced,  $t(65) = -5.53$ ,  $p < .001$ , as was

anxiety,  $t(65) = -2.12$ ,  $p = .038$ , and depression,  $t(65) = -2.79$ ,  $p = .007$ , whereas quality of life improved,  $t(65) = 3.0$ ,  $p = .004$ . These findings were confirmed with a random effects model of condition, time, and the interaction between condition and time. Here we report the outcomes related to the interaction term for the NODS ( $B = -4.39$ ,  $SE = 0.62$ ,  $z = 7.08$ ,  $p < .001$ ), HADS-A ( $B = -1.82$ ,  $SE = 0.91$ ,  $z = -1.99$ ,  $p = .046$ ), HADS-D ( $B = -3.08$ ,  $SE = 0.88$ ,  $z = 3.50$ ,  $p < .001$ ), and QOLI ( $B = 1.15$ ,  $SE = 0.32$ ,  $z = 3.23$ ,  $p < .001$ ).

As compared with baseline, the NODS remained low in the experimental group at 6, 18, and 36 months, all  $ts(33) > 14.83$ , all  $ps < .001$ . The same conclusion holds for the HADS-A, all  $ts(33) > 6.07$ , all  $ps < .001$ , and HADS-D, all  $ts(33) > 5.90$ , all  $ps < .001$ , as well as the QOLI, all  $ts(33) > 4.70$ , all  $ps < .001$ .

At 18- and 36-month follow-ups, all participants were contacted over the telephone by an independent clinician for a clinical global impression. At 18 months, 6 participants could not be reached; under the intention-to-treat principle, they were regarded as showing no improvement at all. The corresponding number at 36 months was 9. The results at 18 and 36 months were no improvement (17.6%, 26.5%), small improvement (14.7%, 0%), moderate improvement (17.6%, 11.8%), and large improvement (50.0%, 61.8%).

At the follow-ups, given the assumption that participants who had not provided data were unimproved and still gambling, the following proportions of the original sample had not gambled during the past month: at 6 months, 67.6%; at 18 months, 61.7%; and at 36 months, 55.9%.

### Discussion

The treated participants achieved significant improvement on measures of pathological gambling, general anxiety, depression, and quality of life. Moreover, the treatment effects were maintained up to 36 months, at which time three quarters of the randomized participants showed a moderate or large improvement as judged by an independent clinician. However, as people on the waiting list, for ethical reasons, received treatment before the follow-up data were collected, there was unfortunately no between-group comparison at follow-up. The facts that pathological gambling does not always follow a chronic and persistent course and that a substantial proportion of individuals with a history of pathological gambling eventually recover without formal treatment (Slutske, 2006) may have unduly boosted the results and led us to overestimate the true effect of the treatment.

The effect sizes (ES) in this study were lower at posttreatment than were those reported in the meta-analysis by Pallesen et al. (2005;  $d = 2.01$  vs. 0.83). However, the higher ES were reported possibly to be an effect of measurement problems, with ES sometimes being based on a single item or on scales without adequate psychometric properties. Nonetheless, the present study reports higher ES at 18- and 36-month follow-up compared with the mean of the 29 studies included in Pallesen et al.'s meta-analysis ( $ds = 1.96$  and 1.98 vs. 1.59). However, these ES should be interpreted with caution, as they include very different outcome dimensions. Instead, a wider range of gambling measures should be used, as suggested in the Banff, Alberta, Consensus (Walker et al., 2006). Unfortunately, this study was started before the publication of the framework for reporting outcomes.

Table 1  
Means, Standard Deviations, and Effect Sizes at Pre, Post, and Follow-Up Testing After Last Observation Carried Forward Was Tested

Measure	Intervention (n = 34)		Waiting list (n = 32)		Effect size (d)	
	M	SD	M	SD	Within	Between
Gambling (NODS)						
Pre	8.21	1.32	7.84	1.39		
Post	1.97	2.94	5.84	2.74	2.93	1.36
6 months	0.68	1.15			6.10	
18 months	1.41	2.20			3.86	
36 months	0.67	1.55			4.28	
Anxiety (HADS-A)						
Pre	8.97	3.33	8.72	3.30		
Post	5.12	3.57	7.03	3.75	1.12	0.52
6 months	3.91	2.25			1.81	
18 months	3.82	2.55			1.75	
36 months	4.32	3.67			1.33	
Depression (HADS-D)						
Pre	6.97	3.49	6.34	3.39		
Post	4.03	3.42	6.16	2.73	0.85	0.69
6 months	2.56	3.02			1.36	
18 months	2.97	3.20			1.20	
36 months	3.12	2.58			1.27	
Quality of life (QOLI)						
Pre	1.55	1.26	1.51	1.59		
Post	2.58	1.29	1.47	1.75	0.81	0.73
6 months	2.89	1.25			1.07	
18 months	2.88	1.32			1.03	
36 months	2.81	1.22			1.02	

Note. NODS = National Opinion Research Center DSM Screen for Gambling Problems; HADS-A = Hospital Anxiety and Depression Scale-Anxiety; HADS-D = Hospital Anxiety and Depression Scale-Depression; QOLI = Quality of Life Inventory.

Because there were no face-to-face meetings and all diagnoses were made by telephone, diagnostic reliability may have been compromised. However, asking participants to attend a clinical selection interview would have induced self-selection bias, and it should be kept in mind that this study was designed to target any pathological gamblers, even those who would not otherwise seek treatment. Because the research staff never met the participants in person, there was a risk of including individuals with extreme suicidal tendencies. To minimize this risk, we excluded people who were suicidal, according to the MADRS. Hypothetically, this may have led to a sample of people who were less depressed than the larger population of pathological gamblers. Hence, it is uncertain how the treatment would affect a more severely depressed group.

As we did not include a comparison treatment, specificity of the findings cannot be assured. Consequently, future studies should investigate the issue of specificity of Internet-based self-help interventions, the role of community online support, and the non-specifics of therapist contact that are likely to be present in both telephone and Internet consultations. Additionally, comparisons with standardized face-to-face therapy are imperative. Dismantling studies are strongly encouraged in order to evaluate the costs and benefits of briefer or more intensive combined treatments (cf. Palmqvist, Carlbring, & Andersson, 2007).

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