Internet-based delivery of Cognitive Behaviour Therapy versus Monitoring, Feedback and Support for Pathological Gambling

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Executive Summary

**Introduction:** The Internet is fast becoming an important tool for delivering mental health services and may hold considerable promise for treating pathological gamblers. To date, evidence supports cognitive behavioural therapy (CBT) as the best practice approach to treating pathological gambling. A further advantage of CBT is that it is easily transferred to Internet-based delivery. However, an important question to pose in delivering cost-effective treatments is to consider if brief interventions using only monitoring, feedback and support (MFS) may be equally effective. This project explored the efficacy of an Internet-based treatment program for pathological gambling. Known as *Improving the Odds*, this project was the first Australian study to examine the use of the Internet in providing psychological treatment to pathological gamblers and to our knowledge the only study in the world to date to compare Internet-based CBT for pathological gambling to an active treatment control condition (Internet-based MFS) in addition to a waitlist control condition. The association between pre-treatment variables (i.e., depression, alcohol use, gambling severity, number of sessions completed and age) and treatment outcome in Internet-based treatment for pathological gambling was also explored.

**Method:** One hundred and seventy-four participants were randomly allocated to Internet CBT (I-CBT), Internet MFS (I-MFS) or Waitlist Conditions. The dependent variables assessed included frequency of gambling, amount ($ spent) of gambling and gambling severity as well as gambling correlates such as gambling urges, gambling cognitions, gambling refusal self-efficacy, depression, anxiety, stress, alcohol use, quality of life, satisfaction with life and coping. Fifty-four percent of participants had not previously sought professional help for gambling.

**Results:** The results indicated that I-CBT resulted in substantial improvements relative to waitlist control. Compared to participants completing the waitlist control condition,
participants completing I-CBT noted significantly greater reductions in gambling amount, gambling frequency, gambling severity, gambling urge, gambling related cognitions, depression, anxiety and stress. They also reported increased gambling refusal self-efficacy as well as improved quality of life and satisfaction with life. Fewer differences were noted between I-MFS and the waitlist control condition: compared to participants completing the waitlist control condition, participants completing I-MFS noted significantly greater reductions in gambling severity and were more likely to note improved quality of life. Compared to participants completing the I-MFS condition, participants completing I-CBT noted significantly greater reductions in gambling urge, gambling related cognitions and stress and reported higher treatment satisfaction. Therapeutic gains for I-CBT and I-MFS were maintained at follow-up (3-, 6- and 12-months post-treatment). Higher number of sessions completed was significantly associated with positive change in gambling related cognitions in I-CBT and I-MFS. A relationship was also found between less positive change in gambling refusal self-efficacy and older age in I-CBT and I-MFS. Higher pre-treatment gambling severity was associated with less change in gambling urge but not in gambling severity across treatment in I-CBT whereas within I-MFS higher pre-treatment gambling severity was associated with less change in gambling severity across treatment. No association between pre-treatment depression and alcohol use with treatment outcome was found. Comparison of effect sizes between Internet-based CBT and face-to-face CBT indicated that both programs were equally effective in producing improvements in gambling amount, gambling frequency, the Gambling Urge Scale (GUS) and the Gambling Refusal Self-Efficacy Questionnaire (GRSEQ) across treatment. The face-to-face CBT program was more effective in producing improvement in gambling related cognitions than the Internet-based CBT program.
**Discussion:** The results from this project provide clear evidence that providing treatment via the Internet is a useful addition in approaches to dealing with pathological gambling. Our findings suggest that Internet-based cognitive behavioural treatment appears to hold particular promise for the treatment of pathological gamblers. The effects of Internet-based CBT were demonstrated to be more than simply the non-specific effects expected as a result of engaging in treatment with a greater number of significant improvements in I-CBT than in I-MFS as compared to waitlist control observed across the full range of outcome variables. Our comparison of effect sizes obtained in Internet-based CBT and an earlier trial of face-to-face CBT by the same research team provides preliminary evidence that both treatments may be similarly effective in the treatment of pathological gambling, although a more stringent examination of this hypothesis involving random allocation of participants to either face to face or Internet-based CBT is desirable. Our results indicate that an Internet-based treatment that utilizes an evidence-based structured approach such as CBT provides a useful addition to current treatment options. Further research should be undertaken to explore the ways I-CBT can be augmented with either additional Internet or face-to face based treatment components and extended to a broader range of individuals affected by gambling problems.
Conference Presentations Arising from Research


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Section 1: Introduction

1.1 Overview

Results from a growing number of treatment studies for pathological gambling indicate that a majority of individuals who complete psychological treatment find considerable symptom relief (Pallesen, Mitsen, Kvale, Johnson, & Molde, 2005). However, despite these promising results, a major challenge for treatment providers is to ensure that treatment can also be easily accessed by those individuals in need. Less than 10% of people with a gambling problem consult a mental health professional for psychological treatment (Brown, 1986; Evans & Delfabbro, 2005; Hodgins & El Guebaly, 2000). Although many factors may potentially relate to the difficulty of engaging individuals with gambling problems in treatment, one way of addressing this issue is to examine more easily accessible means of disseminating psychological treatment to this population. In other areas of mental health, treatment approaches incorporating technological advances such as the Internet are being explored with the aim of increasing the ease with which people with a diverse range of disorders can access psychological treatment (Christensen & Griffiths, 2002). Accordingly, we developed an Internet-based treatment program for pathological gamblers, known as Improving the Odds. The project described in this report is to our knowledge the first Australian study to examine the use of the Internet in providing psychological treatment to pathological gamblers and the only study to date in the world to compare Internet-based treatment of pathological gambling using an active treatment control condition as well as a waitlist condition.
1.2 Pathological Gambling

In order to effectively explore treatment approaches for pathological gamblers it is initially important to understand what constitutes a gambling problem. Broadly, gambling is defined as risking something of value on the outcome of an event when the probability of winning or losing is less than certain and determined by chance (Korn & Shaffer, 1999). Gambling can include a range of diverse activities that take place in an array of different settings. For example, gambling may involve betting on activities such as: lotteries, casino games (e.g., black-jack, roulette), horse racing, sports, bingo games, electronic gambling devices or scratch raffle tickets (Smeaton & Griffiths, 2004). The organisations and settings that provide these services typically include: casinos, clubs, hotels, sports betting enterprises and lottery organisations. Many individuals are also beginning to gamble on games and activities based on the Internet (i.e., Internet gambling) (Smeaton & Griffiths, 2004).

Gambling behaviour can vary from one individual to another in terms of the intensity and duration of the behaviour, and the consequences associated with the behaviour (Productivity Commission, 1999). The Productivity Commission (1999) observed that gambling behaviour occurs on a continuum ranging from social gambling to pathological gambling. For social gamblers, gambling is a recreational pursuit that brings either no problems or only a small number of minor, transient problems. However for pathological gamblers, gambling becomes a significant concern. The American Psychiatric Association, in the Diagnostic and Statistical Manual of Mental Disorders 4th edition text revision (DSM-IV-TR), classifies pathological gambling as occurring when attempts to win money by investing on the outcome of uncertain events are persistent and maladaptive (American Psychiatric Association, 2000). The essential features of pathological gambling outlined by the American Psychiatric Association (2000) are: (1) a continuous or periodic loss of control over gambling; (2) a progression, in gambling frequency and amounts wagered, in the preoccupation with
gambling and in obtaining monies with which to gamble; and (3) a continuation of gambling involvement despite adverse consequences.

The DSM-IV-TR specifies ten clinical criteria for determining pathological gambling. The criteria cover many characteristics of the problem but have a greater emphasis on psychological characteristics such as preoccupation, development of tolerance, irritability, and gambling as an escape. The ten criteria are as follows:

1. preoccupied with gambling
2. needs to gamble with increasing amounts of money in order to achieve the desired excitement
3. repeated unsuccessful efforts to control, cut back, or stop gambling
4. is restless or irritable when attempting to cut down or stop gambling
5. gambles as a way of escaping from problems or of relieving a dysphoric mood
6. after losing money gambling, often returns another day to get even
7. lies to family members, therapist, or others to conceal the extent of involvement with gambling
8. has committed illegal acts such as forgery, fraud, theft, or embezzlement to finance gambling
9. has jeopardized or lost a significant relationship, job, educational or career opportunity because of gambling
10. relies on others to provide money to relieve a desperate financial situation caused by gambling.

Five of the ten criteria must be present for a diagnosis of pathological gambling to be made. Pathological gambling has also been called compulsive gambling or disordered gambling. Similarly, although not a formal diagnostic category, problem gambling is a term often used to describe a person has developed some of the occupational, financial or family
problems associated with gambling but has not met at least five of the DSM-IV-TR criteria (Blaszczynski, 2005). Although the terms problem gambling and pathological gambling are sometimes used interchangeably, the term pathological gambler within this report refers to individuals who meet DSM-IV-TR criteria for pathological gambling.

In addition to American Psychiatric Association diagnostic criteria, there are a number of screening and diagnostic criteria used to assess problem or pathological gambling. The most widely used measure is the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987). The SOGS is a 20-item questionnaire which is based on DSM-IV criteria to screen for pathological and problem gambling (Lesieur & Blume, 1987). This measure poses questions about a gambler’s behaviour, such as whether they ‘chase’ losses, have problems controlling their gambling, gamble more than intended, feel guilty about gambling and believe that they have a problem. The SOGS assesses gambling behaviour on a continuum ranging from: no problem with gambling, some problem with gambling, and probable pathological gambling. Another measure of gambling behaviour is the Canadian Problem Gambling Index (CPGI) (Smith & Wynne, 2002). The CPGI is a 31 item self-report measure that assesses involvement in various forms of gambling, problem gambling, correlates of problem gambling and demographic variables (Smith & Wynne, 2002). The CPGI has been used widely in community studies of gambling and assesses gambling behaviour as non-problem gambling, low risk, moderate risk, problem gambling. The DSM-IV, SOGS and CPGI have been used widely in research assessing the extent of pathological and problem gambling among the general public.

1.2.1 The Extent of Problems related to Gambling

A significant number of individuals experience substantial problems as a result of their gambling behaviour. The Productivity Commission’s (1999) study with 10,600 adults found
that approximately 300,000 (2.1%) Australian adults had significant problems with their
gambling, and a further 130,000 (1%) experienced severe problems. The Commission’s
assessment of the prevalence of problem gambling used the SOGS supported by self-
assessment questions and other indicators. These findings are consistent with a number of
regional studies of gambling behaviour in Australia. For instance, a study conducted in South
Australia using a random sample of 6,045 adults, estimated that 1.9 per cent of adult South
Australians were problem gamblers (Centre for Population Studies in Epidemiology, 2001).
A further study surveyed 5,445 adults in the Australian Capital Territory (Australian Institute
for Gambling Research, 2001). The results indicated that 1.9% or 5,297 adults living in the
Australian Capital Territory were experiencing gambling problems. Assessment of the
prevalence of problem gambling in both studies used the same methodology as the
Productivity Commission (i.e., SOGS supported by self-assessment questions and other
indicators). A more recent survey conducted by the Queensland Government identified that
0.47% of Queenslanders have a sufficient problem with their gambling that they face financial
difficulties, jeopardise relationships, and risk their jobs (Queensland Government, 2008). A
further 1.80% of Queenslanders were identified as at risk of facing financial difficulties,
jeopardising relationships, and risking their jobs as a result of gambling behaviour.
Assessment of gambling within this study used the CPGI.

Other studies have reported that problematic gambling is experienced by a
considerable number of individuals around the world. For example, in Canada, the 2003
Nova Scotia Prevalence study documented that about 6.9% or about 50,000 adults in Nova
Scotia are at some level of risk for problem gambling. Approximately 0.8% of adults were
identified as experiencing severe gambling problems. A more recent study conducted with
34,770 individuals across several Canadian provinces, reported that the 12-month prevalence
of severe problem gambling in Canada was 2.0% (Cox, Yu, Afifi, & Ladouceur, 2005).
Assessment of prevalence in both studies used the CPGI to assess gambling problems. Within the United States, the National Opinion Research Centre’s (NORC) *Gambling Impact and Behaviour Study* (1999) explored the prevalence of problem gambling in a sample of 2,947 individuals. A structured interview, the DSM Screen for Gambling Problems was developed to determine the prevalence of problem gambling in this study. The screen classified respondents as non-gamblers, low-risk (gamblers with no adverse effects), at-risk (gamblers meeting one or two of the DSM criteria), problem (gamblers meeting three or four criteria), and pathological (gamblers meeting five or more criteria). The results indicated that about 7.9% of individuals were at risk of developing problems with their gambling behaviour; a further 1.3% were identified as problem gamblers, and 0.8% as pathological gamblers. In Great Britain, a random survey of the 5,453 individuals in England, Wales and Scotland, documented problem gambling prevalence rates of 0.8% according to the SOGS. Overall, these findings suggest that globally a significant number of individuals experience problems as a result of gambling behaviour.

1.2.2 The Impact of Pathological Gambling

Pathological gambling is associated with a range of negative consequences that are not only confined to the gambler themselves, but also impact on family members, friends, employers and other people. Individuals with pathological gambling have been shown to exhibit a greater amount of psychological difficulties such as increased anxiety disorders, mood disorders, feelings of guilt, thoughts of suicide or attempted suicide, lower quality of life, substance use, personality disorders and attention deficit disorders (Crockford & el Guebaly, 1998; Grant & Kim, 2005). Family and marital problems such as domestic violence and divorce are also a common result of pathological gambling (Lorenz & Shuttlesworth, 1983; Productivity Commission, 1999). Spouses of pathological gamblers report higher rates
of emotional distress with feelings of anger, depression, and helplessness as well as higher levels of physical symptoms such as severe headaches, nausea, ulcers, bowel problems and breathing difficulties, and are major users of psychological help services (Lorenz & Shuttlesworth, 1983; Lorenz & Yaffee, 1988). Children of pathological gamblers are more likely to experience psychological difficulties such as feelings of anger, hurt, loneliness, guilt, abandonment, rejection, anxiety, depression, insecurity, inadequacy and inferiority, and are more at risk of encountering physical violence from their parents than children of parents without gambling problems (Jacobs, Marston, Singer, Widaman, & et al., 1989; Leiseur & Rothschild, 1989). Financial, employment and legal problems are also common among pathological gamblers (Lorenz & Shuttlesworth, 1983). Preoccupation with gambling, absenteeism due to gambling during work hours, gambling induced physical illnesses, poor concentration and attention due to gambling induced psychological difficulties, theft to finance gambling debts and co-morbid substance abuse all act to reduce an individual’s efficiency and productivity in the workplace (Productivity Commission, 1999). In severe cases, these may result in court cases, police charges and prison sentences.

1.3 Psychological Treatment for Pathological Gambling

A range of psychological treatment approaches have been developed for pathological gambling. Psychological treatments include psychodynamic therapy (Victor & Krug, 1967), couples or family based treatment (Heineman, 1994), supportive group therapy (Stewart & Brown, 1988), aversion therapy (Anderson & Brown, 1984), self-help treatments (Hodgins, Currie, & el Guebaly, 2001), motivational treatments (Hodgins, Currie, el-Guebaly, & Peden, 2004), online counselling (McCorriston & Laidlaw, 2000), behavioural therapy (McConaghy, Armstrong, Blaszczynski, & Allcock, 1988; McConaghy, Blaszczynski, & Frankova, 1991), cognitive therapy (Gaboury, Ladouceur, & Bussieres, 1989) and cognitive behavioural
therapy (Echeburua, Baez, & Fernandez-Montalvo, 1996; N. Raylu & Oei, 2002). Currently behavioural, cognitive and cognitive behavioural therapies have received the greatest amount of research attention (Raylu & Oei, 2002).

Cognitive treatments focus on challenging and correcting the client’s thinking errors by for example, exploring and understanding the illusion of control over chance events. Behavioural therapy considers pathological gambling a learned behaviour and relies on techniques such as systemic exposure or desensitisation and skill development (e.g., coping and communication skills). Cognitive behavioural therapy combines elements from both the behavioural and cognitive treatment approaches, and therefore assumes that pathological gambling is precipitated and maintained by a set of cognitive distortions and problematic reinforcement schedules. During cognitive behaviour therapy, the therapist and client work together to identify specific patterns of thinking and behaviour that underpin the client’s gambling difficulties. Treatment continues between sessions with homework assignments intended to monitor and challenge specific thinking patterns and also to implement behavioural changes.

Two recent reviews of outpatient psychological treatments for pathological gambling concluded that cognitive behavioural interventions show considerable promise for the treatment of pathological gambling (Pallesen, et al., 2005; Toneatto & Millar, 2004). Furthermore, a recent meta-analysis of psychological treatments for pathological gambling showed a large effect size of favourable outcomes (2.01, p< 0.1 at post-treatment) (Pallesen, et al., 2005). The efficacy of cognitive behavioural therapy has also been demonstrated in several studies (Robert Ladouceur & Sylvain, 1999; R. Ladouceur, et al., 2003). For instance, Ladouceur and Sylvain (1999) examined the efficacy of a cognitive behavioural program in a sample of pathological gamblers. Pathological gamblers were randomly assigned to a cognitive behavioural program consisting of cognitive correction of erroneous perceptions
about gambling, problem solving training, social-skills training and relapse prevention, or wait-list control conditions. Results indicated significant changes in the treatment group on all outcome measures, including reduction in gambling severity, frequency of gambling and desire to gamble, as well as an increase in perception of control and perceived self-efficacy. Treatment gains were maintained at 6- and 12 month follow-ups. A further study conducted by Ladouceur, Sylvain, Boutin, Lachance, Doucet and Leblond (2003) explored the effectiveness of group based cognitive treatment for pathological gambling. Post-treatment results showed that 88% of the treated participants no longer met the DSM-IV-TR criteria for pathological gambling compared to only 20% in the control group. Again, treatment gains were maintained at 6-, 12- and 24-month follow-ups.

1.4 Internet-based Treatment for Pathological Gambling

The Internet is fast becoming an important tool for delivering mental health interventions due to its relative advantages over face-to-face treatment. Internet-based psychological treatment can be more accessible than face-to-face treatment. Recent Australian Bureau of Statistics (Australian Bureau of Statistics, 2007) figures indicate that 60% of Australian homes have access to a computer and that the percentage of households with Internet access continues to increase and has almost quadrupled between 1998 (16%) and 2005-06 (60%). Internet-based psychological treatment is also more cost-effective, less labour intensive, updateable, available on a 24-hour basis, self-paced and available to anyone (including those who are constantly on the move and those who live in rural or regional areas) who has access to the Internet. Internet-based treatment may also overcome barriers that may prevent gamblers from seeking face-to-face help. For instance, of particular relevance to the use of Internet-delivered treatment for pathological gambling is the observation that some individuals may prefer the Internet to other methods of delivering and receiving mental health
interventions because of its anonymity (Griffiths & Cooper, 2003). Examining the reasons that pathological gamblers may delay seeking treatment, Tavares and his colleagues (Tavares, Martins, Zilberman, & el Guebaly, 2002) found that shame and secrecy regarding gambling were amongst the strongest predictors of delay. Certainly, there is evidence that people generally are more willing to admit vulnerabilities to a computer (Robinson, Patrick, Eng, & Gustafson, 1998). In a small group of studies comparing e-therapy with traditional psychotherapy, it was found that many individuals find it easier to self-disclose on the computer than in face-to-face situations (Wallace, 1999). Thus, development of Internet-based interventions may reduce the embarrassment and shame that prevents some pathological gamblers from obtaining treatment by more traditional means and provide a highly useful addition to treatment options in this area.

The main approach to using the Internet to provide psychological treatment is termed Internet-based treatment and refers to web-based treatment programs delivered by structured web pages that the participant works through more or less independently on the Internet (i.e., with minimal therapist contact) (Strom, 2003). This approach has been found to be associated with positive outcome in a number of psychological disorders including depression (Clarke, et al., 2005; Clarke, et al., 2002; Patten, 2003), panic disorder (Carlbring, et al., 2005; Carlbring, Westling, Ljungstrand, Ekselius, & Andersson, 2001), posttraumatic stress disorder (Lange, et al., 2003; Lange, et al., 2000; Lange, van de Ven, Schrieken, & Emmelkamp, 2001) and social phobia (Carlbring, Furmark, Steczko, Ekselius, & Andersson, 2006). It should be noted that this form of Internet-based treatment is distinctly different to unstructured online counselling services, about which far less is known in regard to efficacy and effectiveness.

When the present study was initiated, there were no published studies concerning the efficacy of Internet-based treatment for pathological gambling. More recently, however, progress has been made by researchers in Sweden with the development of an Internet-based
program for the treatment of pathological gambling (Carlbring & Smit, in press). The
Internet-based program was based on established cognitive behavioural methods and was
divided into eight online treatment modules. The first four modules had a motivational
interviewing focus and the remaining four modules had a CBT focus. Two hundred and
twenty-four individuals registered their interest in participating in this study. From this initial
sample, 66 participants were randomly allocated to either the Internet-based treatment
program (n=34) or a waitlist-control condition (n=32). The results indicated that the Internet-
based intervention resulted in favourable changes in pathological gambling, anxiety,
depression and quality of life. Follow-ups carried out in the treatment group at 6-, 18- and
36- months post treatment indicated that treatment effects were sustained.

Although this study represents a useful attempt to develop an Internet-based treatment
in the area of pathological gambling, it has a number of important limitations. Firstly, the
sample recruited by Carlbring and Smit (2008) excluded gamblers with a severe level of
depression. Given that gambling is often associated with a high level of depression
(Productivity Commission, 1999), the sample used in this study is unlikely to be
representative of the total population of pathological gamblers. It is not clear how effective
Internet-based treatment is for severely depressed individuals amongst this population.
Secondly, therapists in this study maintained weekly telephone contact with participants. It
would be useful to explore the efficacy of an Internet-based program that does not include
weekly telephone calls to participants as the need to provide such calls may limit the number
of individuals who could be assisted through such programs. Furthermore, Carlbring & Smit
compared their Internet-based program to a waitlist control condition only. Whilst this type
of design is in line with majority of studies exploring Internet-based treatments for
psychological disorders, and at least allows for a comparison of treatment versus no
treatment, it does little to control for the effects of treatment participation. Furthermore, it
leaves open the question as to whether Internet-based treatment requires the same duration (approximately one hour per week), complexity or degree of structure normally involved in face-to-face psychological treatment. For instance, it is possible that some gamblers may perceive that completing a full structured Internet-based CBT program is too onerous in its time demands or is superfluous to their needs. Recent findings in the substance abuse treatment literature suggest that for some individuals monitoring, feedback and support may provide a brief, cost-effective intervention (Kunz, French, & Bazargan-Hejazi, 2004; Shakeshaft, Bowman, Burrows, Doran, & Sanson-Fisher, 2002). In a sample of 195 problem drinkers, Kunz et al. (2004) explored the efficacy of a brief single-session intervention during which participants were provided counselling and health information. The results indicated that the intervention was effective in reducing problematic drinking behaviour. In a further study with 295 individuals receiving outpatient treatment for problematic alcohol use, Shakeshaft and colleagues (2002) compared the efficacy of a brief intervention (90 minutes) using FRAMES (feedback, responsibility, advices, menu, empathy and self-efficacy) to a six session CBT program. Treatment outcomes between the brief intervention and CBT were not statistically significantly different, and there were no differences between the treatment conditions in participants' reported levels of satisfaction. Overall, these findings suggest that to extend our knowledge of the potential uses of the Internet in assisting individuals with gambling problems, it is important to examine the outcome of a structured Internet-based CBT program in comparison to a brief Internet-based intervention involving the basic elements of monitoring, feedback and support (MFS). Contrasting such conditions would not only provide a control for the non-specific effects of treatment engagement via the Internet, but would assess whether a brief intervention delivered via the Internet may in fact represent an effective treatment for some individuals.
1.5 Aims and Hypotheses

1.5.1 Aim One

The first aim of this project was to evaluate Internet-based CBT for pathological gambling and Internet-based MFS for pathological gambling. It was hypothesised that participants completing Internet-based CBT and participants completing Internet-based MFS would demonstrate significantly greater reductions in gambling behaviours than participants in a waitlist condition at post-treatment. It was also hypothesised that treatment gains would be maintained over 3-, 6- and 12-month follow-up periods.

1.5.2 Aim Two

The second aim of this project was to contrast the effectiveness of Internet-based CBT and Internet-based MFS for pathological gambling. It was hypothesised that participants completing Internet-based CBT would demonstrate a significantly greater reduction in gambling behaviours in comparison to participants completing Internet-based MFS at post-treatment and follow-up (3-, 6- and 12-months post treatment).

1.5.3 Aim Three

Although beyond the scope of our original project, we also elected to explore the relationship between several pre-treatment variables and change in gambling outcome variables in Internet-based treatment for pathological gambling in view of findings that emerged in the literature in the intervening years. The pre-treatment variables examined included: depression, alcohol use, gambling severity, number of sessions completed and age.
1.5.4 Aim Four

Finally, this project aimed to compare the treatment effect sizes associated with face to face versus Internet-based delivery of CBT for pathological gambling. Development of the I-CBT treatment condition was partly based on an earlier face-to-face treatment program that was conducted by the same research team (Oei, Raylu, & Casey, submitted). Use of the same treatment principles enabled comparison of treatment effects associated with face-to-face and Internet-based delivery of a CBT program.
Section 2: Method

2.1 Recruitment and Selection

Participants for the project were individuals living in Australia who volunteered to take part in an Internet-based program to treat their gambling problems. Participants were recruited via Internet, newspaper and radio advertisements about the program offered by Griffith University and the University of Queensland. They were required to be over 18 years of age and to have provided their informed consent after reading information about the study. They were also required to meet Diagnostic and Statistical Manual for Mental Disorders (4th ed.; DSM-IV (American Psychiatric Association, 1994) criteria for pathological gambling as initially assessed using an online checklist. The checklist comprised of ten questions based on DSM-IV criteria for pathological gambling. Respondents were required to indicate yes or no to each item on the checklist. A response of yes to five or more items suggested that the individual would meet DSM-IV criteria for pathological gambling. Participants were excluded from the project if they were receiving additional assistance for their gambling problem; were involved in legal proceedings related to their gambling behaviour; were not proficient with English; at a high risk of suicide; were acutely psychotic; or if their gambling behaviour only occurred in the context of a Manic Episode. All individuals who fulfilled the initial inclusion criteria according to online screening were posted or emailed the pre-treatment questionnaire package. Once the questionnaire package was returned, they were randomly allocated to a therapist and required to complete a telephone clinical interview during which the presence /absence of suicidal symptoms or mania were assessed and the diagnosis of pathological gambling was confirmed using the Diagnostic Interview for Gambling Severity (Winters, Specker, & Stinchfield, 2002).
2.2 Measures

*Gambling Symptom Assessment Scale (GSAS)* *(Kim, Grant, Potenza & Hollander, 2009)*. The GSAS is a 12-item self-report measure of gambling urges, thoughts and behavior. Respondents are required to rate each item on a 5 point Likert scale ranging from 0 (no symptoms) to 4 (extreme symptoms). Thus, total scores range from 0 to 48. Items ask respondents to rate the average intensity of symptoms over the past week. The GSAS has been shown to have high validity and high internal consistency and reliability (Kim et al., 2009). Internal consistency in the current study was good (Cronbach’s alpha = 0.84).

*South Oaks Gambling Screen (SOGS)* *(Lesieur & Blume, 1987)*. Gambling behaviour over the previous month was assessed using the SOGS. Although the SOGS was originally based on DSM-III criteria for pathological gambling, it is highly correlated with DSM-IV diagnostic criteria (r = 0.83 Stinchfield, 2002) and has been widely used in gambling research (Stinchfield, 2002). It has been shown to have high validity and high internal consistency and reliability (Cronbach’s alpha=0.97, p<0.001) (Lesieur & Blume, 1987, 1993). The SOGS is a 20-item questionnaire that is scored by summing selected items. Scores range from 0 to 20 with a score of five or higher indicating probable pathological gambling. Internal consistency in the current study was acceptable (Cronbach’s alpha = 0.69).

*Gambling Urge Scale (GUS)* *(Namrata Raylu & Oei, 2004b)*. The GUS is a six-item questionnaire developed to assess gambling related urges. Participants rate their agreement with each item using a 7 point semantic differential scale ranging from 1 (strongly disagree) to 7 (strongly agree). Individual item responses are summed for a total score ranging from 6 to 42. Higher scores correspond to increased urge to gamble. The GUS has been shown to have high internal consistency (alpha=0.81) and good reliability (Namrata Raylu & Oei, 2004b). Significant positive correlations have been demonstrated with other gambling-related
Instruments including the GRCS. Internal consistency in the current study was excellent (alpha = 0.96).

Gambling refusal self-efficacy questionnaire (GRSEQ). The GRSEQ is a 26-item questionnaire developed to assess an individual’s perceived self-efficacy to refuse an opportunity to gamble in a variety of situations or under certain circumstances. Preliminary analyses indicate that the scale is comprised of four factors including: situations /thoughts, drugs, positive emotions and negative emotions (Casey, Oei, Melville, Bourke, & Newcombe, 2008). Participants respond to each item by indicating how confident they are that they could refuse to gamble on a scale from 0 ‘No Confidence, Cannot refuse’ to 100 ‘Extreme Confidence, Certain can refuse’ in increments of 10. A total score is obtained by calculating the mean score across all items. Total scores range from 0 to 2,600 with higher scores corresponding to increased gambling refusal self-efficacy. The scale has shown to have high internal consistency (Cronbach alpha = 0.98) and each subscale has been shown to have high reliability. Significant negative correlations have been found with gambling behaviour. In the current study, the lowest measure of internal consistency was found for Factor 2 drugs (alpha = 0.92), however this is still well above the accepted limit of 0.70 (Cicchetti, 1994; Cicchetti & Sparrow, 1990). Cronbach’s alpha for the overall scale was also high (0.98).

Gambling Related Cognitions Scale (GRCS; (Raylu & Oei, 2004). The GRCS is a 23-item questionnaire designed to identify the distorted beliefs common amongst pathological gamblers. The scale is comprised of five factors - the illusion of control, interpretative bias, predictive control, expectations of gambling and perceived inability to stop gambling. Participants use a 7-point Likert scale to indicate the extent to which they agree with the value expressed in each statement. Scoring consists of totalling the values such that higher scores indicate higher levels of cognitive distortions (scores range from 23 to 161). The scale has high internal consistency (alpha = 0.93) and each subscale has moderate to high reliability.
(Raylu & Oei, 2004). Significant positive but relatively low correlations have been found with mood (depression, anxiety and stress), and significant positive and moderate correlations have been found with gambling behaviour. Internal consistency in the current study was excellent (alpha = 0.94).

*Depression Anxiety and Stress Scales (DASS-21) (Lovibond & Lovibond, 1995).* The DASS-21 is a 21-item self-report instrument that measures the affective states of depression, anxiety and stress. Respondents are required to rate each item on a 4-point Likert scale according to how much each item applied to them over the past week. Scoring consists of totalling the values and multiplying them by two such that higher scores indicate higher levels of depression, anxiety or stress (scores on each subscale range from 0 to 42). The scales of the DASS-21 have been shown to have high internal consistency, with Cronbach’s alphas of 0.94 for depression, 0.87 for anxiety and 0.91 for stress (Antony, Bieling, Cox, Enns, & Swinson, 1998). Antony et al (1998) provided support for the scale’s concurrent validity through contrasts with the Beck Depression Inventory, the Beck Anxiety Inventory and the State-Trait Anxiety Inventory. The DASS-21 has also been shown to have acceptable test-retest reliability. In the current sample coefficient alphas were: 0.88 for the depression subscale, 0.85 for the anxiety subscale and 0.87 for the stress subscale.

*Alcohol Use Disorders Identification Test (AUDIT).* The 10-item AUDIT was developed to screen for harmful and hazardous alcohol use in the general public (Saunders, Aasland, Babor, De La Fuente, & Grant, 1993). The AUDIT assesses drinking behaviour, alcohol dependence, and alcohol related problems. Scoring consists of totalling the values such that higher scores indicate increased difficulties with alcohol (scores range from 0 to 40). A total score of eight or higher indicates hazardous alcohol use. The measure has been used frequently in Australian studies and found to have good internal reliability with Cronbach
alphas ranging from 0.80 to 0.94 (Dawe, Loxton, Hides, Kavanagh, & Mattick, 2002). Cronbach alpha in current study was similarly high (0.87).

*Coping Style.* Coping style was assessed using items derived from the Brief COPE (Carver, 1997). Items assess:

- **Active coping:** planning to take or taking active steps to deal with the problem (e.g., I concentrate my efforts on doing something about it”);
- **Cognitive coping:** accepting the reality of the problem or viewing the problem in a positive manner (e.g., I accept the reality of the fact that it happened”);
- **Emotion coping:** seeking social support to for instrumental reasons, seeking advice or assistance; or emotional reasons, getting moral support, venting emotions or understanding (e.g., I feel a lot of emotional distress and I find myself expressing those feelings a lot”); and
- **Avoidance coping:** avoid dealing with the problem by engaging in other behaviours such as alcohol and drugs, praying, substitute activities to take mind off the problem; or denying a problem exists (e.g., I use alcohol and drugs to deal with it”).

Respondents were required to rate each item on a 7-point Likert scale ranging from “I haven’t been doing this at all” to “I have been doing this a lot”. Total scores range from 1 to 7 with higher scores indicating that the individual frequently uses this coping style. The brief version of the COPE inventory has been shown to have adequate reliability and validity, with alphas ranging from 0.50 to 0.90 (Carver, 1997).

*Quality of Life Inventory* (QOLI) (Frisch, 1994). The QOLI assesses life satisfaction in 16 areas of an individual’s life. Respondents are required to rate their satisfaction with each of the 16 domains (-3 = very dissatisfied to 3 = very satisfied) as well as indicate how important (0 = not at all important, 1 = important, 2 = extremely important) each domain is to their overall happiness and satisfaction. The instrument produces a measure of global quality
of life which is equal to the sum of multiple satisfaction ratings after they are weighted by their importance to the individual participant. Thus, an overall score is obtained by adding the scores on the subscales and dividing by the number of important subscales (i.e. where the subscale does not = 0). The measure has good reliability and validity (Frisch, Cornell, Villanueva & Retzlaff, 1992). Cronbach alpha in the current study was good (0.80).

*Satisfaction with Life Questionnaire (SWLQ) (Diener, Emmons, Larsen, & Griffin, 1985).* The SWLQ is a five-item self-report measure that assesses global life satisfaction. Respondents indicate their degree of agreement or disagreement on a 7-point Likert-type scale. Items assess various domains including health and material wealth. Scores range from 5 to 35 with higher scores indicating greater life satisfaction. The questionnaire was found to have good internal consistency (alpha=.82) and validity (Diener et al., 1985).

All respondents were asked questions on age, gender, income, education, relationship status, employment, religion, ethnic background, previous professional help-seeking, frequency of computer and Internet use, gambling frequency and amount ($) spent per day on gambling and treatment satisfaction. Participants were also asked to indicate their satisfaction with treatment using a 5-point scale (1 = not at all satisfied, 2 = somewhat satisfied, 3 = moderately satisfied, 4 = very much satisfied, 5 = extremely satisfied).

2.3 Participants and Procedure

The 174 participants who completed pre-treatment procedures were randomly allocated to an active treatment condition (Internet-based Cognitive-Behavioural Treatment (I-CBT) (n=60), Internet-based Monitoring, Support and Feedback (I-MFS) (n=59)) or the six-week waitlist group (n=55). Those assigned to a treatment condition were sent an email with a user name and password to access the treatment areas of the Internet site. Those assigned to the wait-list condition were required to complete a subset of the questionnaires.
three weeks later (mid-wait) and six weeks later (end of wait period). To fulfil an ethical requirement to provide access to treatment, waitlisted participants were randomly allocated to I-CBT or I-MFS following completion of the waitlist period. Treatment or follow-up data from waitlisted participants was not used in statistical analyses in this report. In addition to pre-treatment questionnaires, participants were required to complete questionnaires throughout treatment (i.e., either before or after completing sessions), at post-treatment and at 3-, 6- and 12-month follow-ups. Table 1 displays a schedule of administration, and mode of administration, of questionnaires. As we attempted to collect post-treatment and follow-up data from all dropouts, all 174 participants that were randomised to one of the three conditions were included in the statistical analysis. Demographic data on the 174 participants included in the study is provided in Table 2.

Table 1. Schedule of administration of questionnaires

<table>
<thead>
<tr>
<th></th>
<th>GSAS</th>
<th>SOGS</th>
<th>Gambling Amount and Frequency</th>
<th>GUS</th>
<th>GRSEQ</th>
<th>GRCS</th>
<th>DASS</th>
<th>AUDIT</th>
<th>COPE</th>
<th>QOLI</th>
<th>SWLQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-treatment</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Mid-wait</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
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<tr>
<td>End of wait period</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Session 1</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Session 2</td>
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<td></td>
</tr>
<tr>
<td>Session 3</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td></td>
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<tr>
<td>Session 5</td>
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<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-treatment</td>
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<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>3-month Follow-up</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>6-month Follow-up</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>12-month Follow-up</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

X = questionnaire completed
GSAS = Gambling Symptom Assessment Scale; SOGS = South Oaks Gambling Screen; GUS = Gambling Urge Scale; GRSEQ = Gambling Refusal Self Efficacy Questionnaire; GRCS = Gambling Related Cognitions Scale; DASS = Depression, Anxiety and Stress Scale; AUDIT = Alcohol Use Disorders Identification Test; QOLI = Quality of Life Inventory; SWLQ = Satisfaction with Life Questionnaire.
### Table 2. Demographic Characteristics of Participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>I-CBT</th>
<th>I-MFS</th>
<th>Waitlist</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>44.82 (9.02)</td>
<td>44.08 (10.48)</td>
<td>44.18 (9.51)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>42</td>
<td>39</td>
<td>42</td>
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<tr>
<td>Female</td>
<td>58</td>
<td>61</td>
<td>58</td>
</tr>
<tr>
<td><strong>Relationship Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>42</td>
<td>32</td>
<td>29</td>
</tr>
<tr>
<td>In a relationship</td>
<td>58</td>
<td>68</td>
<td>71</td>
</tr>
<tr>
<td><strong>Annual Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$10000AU</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>$10000-29000</td>
<td>20</td>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>$30000-49000</td>
<td>35</td>
<td>32</td>
<td>22</td>
</tr>
<tr>
<td>&gt;$50000</td>
<td>38</td>
<td>43</td>
<td>57</td>
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<tr>
<td><strong>Education (highest level)</strong></td>
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<td></td>
</tr>
<tr>
<td>Primary</td>
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<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Junior secondary</td>
<td>15</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Senior Secondary</td>
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<td>25</td>
<td>33</td>
</tr>
<tr>
<td>Certificate/Diploma</td>
<td>34</td>
<td>41</td>
<td>33</td>
</tr>
<tr>
<td>Bachelor/Higher Degree</td>
<td>17</td>
<td>22</td>
<td>27</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Full time</td>
<td>53</td>
<td>68</td>
<td>73</td>
</tr>
<tr>
<td>Part time</td>
<td>20</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>Full time students</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>25</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Caucasian</td>
<td>81</td>
<td>76</td>
<td>82</td>
</tr>
<tr>
<td>Asian</td>
<td>2</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
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<td>18</td>
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<td><strong>Religion</strong></td>
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<td>Catholic</td>
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<tr>
<td>No religion</td>
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<td>26</td>
<td>38</td>
</tr>
<tr>
<td>Protestant</td>
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<td>10</td>
<td>6</td>
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<tr>
<td>Other</td>
<td>17</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td><strong>Previous professional help seeking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>53</td>
<td>54</td>
<td>55</td>
</tr>
<tr>
<td>No</td>
<td>47</td>
<td>46</td>
<td>45</td>
</tr>
<tr>
<td><strong>Frequency of computer use</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Daily</td>
<td>86</td>
<td>95</td>
<td>87</td>
</tr>
<tr>
<td>Weekly</td>
<td>12</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Less than once per month</td>
<td>2</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td><strong>Frequency of Internet use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily</td>
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</tr>
<tr>
<td>Weekly</td>
<td>14</td>
<td>19</td>
<td>13</td>
</tr>
<tr>
<td>Less than once per month</td>
<td>2</td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>
2.4 Treatment

The *Improving the Odds* program was developed to assist pathological gamblers to either control or abstain from gambling. The program was available in Australia only, where face-to-face gambling treatment services are also freely available primarily through government-based funding to counselling agencies. Participants completed sessions online, once a week for six weeks. The program was designed so that participants received access to a session one week after completing the previous session. Participants completed the program from the privacy of their own computer and were able to use email to correspond with their allocated therapist on issues of technical problems, completing the program and crisis management. Telephone contact was kept to a minimum with the exception of the telephone-based clinical interview. There were four therapists, all of whom were completing advanced training in Clinical Psychology. All met criteria for conditional registration with the Psychologists Board of Queensland and had previous experience in delivering CBT. Therapists were provided with weekly supervision by one of the Chief Investigators (Casey).

*I-CBT*. Development of I-CBT treatment condition was based on CBT principles as used in the face-to-face treatment program developed by Raylu and Oei (2002) and reported in Oei, Raylu & Casey (2008). The Internet-based version of the treatment was developed by the first author (Casey). In order to duplicate the interactive style of face to face treatment as much as possible, participants were provided with a series of interactive exercises throughout each session, as well as graphical feedback on their progress at the beginning of each session. Session one aimed to increase awareness of factors that may be playing a role in gambling behaviour and also to provide strategies to stabilise gambling. Sessions two and three aimed to identify gambling and general thinking errors, challenge these thinking errors and replace them with more helpful thoughts and help individuals to get out of debt. Session four focused on imaginal exposure and also aimed to help individuals learn how to apply relaxation
strategies. Session five focused on problem solving, setting goals and learning how to deal with negative emotions. Finally, session six aimed to help individuals to maintain their progress and prevent relapse. Sample WebPages from I-CBT are contained in Appendix 1.

**I-MFS.** Participants in the I-MFS treatment condition were only provided access selected portions (or “pages”) of the weekly session content provided to participants in the I-CBT condition. These pages dealt only with assisting them to monitor their gambling, providing feedback on their progress and giving supportive messages. Participants in I-MFS do not have access to any additional CBT tasks or strategies during their Internet treatment period. Whereas completion of I-CBT requires approximately one hour per session, participants in the I-MFS condition were required to spend only 5 to 10 minutes completing each session. WebPages from I-MFS are contained in Appendix 2.
Section 3: Results

3.1 Preliminary Analyses

A comparison of pre-treatment study variables between the three conditions (I-CBT, I-MFS and waitlist) is shown in Table 3. Despite the use of random allocation, participants in the I-CBT reported significantly lower quality of life and life satisfaction prior to receiving treatment than participants in either I-MFS or waitlist condition.

Table 3. Mean (Standard Deviation) and Group Differences of pre-treatment study variables for I-CBT, I-MFS and Waitlist Groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>I-CBT</th>
<th>I-MFS</th>
<th>Waitlist</th>
<th>Group Effect</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSAS</td>
<td>31.46 (7.36)</td>
<td>32.94 (7.15)</td>
<td>31.76 (6.29)</td>
<td>0.71</td>
<td>0.50</td>
<td></td>
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<tr>
<td>SOGS</td>
<td>9.97 (3.27)</td>
<td>10.27 (2.81)</td>
<td>10.38 (2.76)</td>
<td>0.31</td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td>Gambling Amount</td>
<td>565.88 (456.82)</td>
<td>605.13 (483.14)</td>
<td>300.43 (300.97)</td>
<td>1.22</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>Gambling Frequency</td>
<td>4.82 (2.10)</td>
<td>4.72 (1.87)</td>
<td>4.60 (1.76)</td>
<td>0.18</td>
<td>0.83</td>
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<tr>
<td>GUS</td>
<td>22.18 (11.19)</td>
<td>20.00 (11.33)</td>
<td>20.05 (10.34)</td>
<td>0.76</td>
<td>0.47</td>
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<tr>
<td>GRCS</td>
<td>84.80 (27.17)</td>
<td>81.58 (24.19)</td>
<td>75.29 (19.42)</td>
<td>2.33</td>
<td>0.10</td>
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<tr>
<td>GRSEQ</td>
<td>934.00 (503.14)</td>
<td>978.81 (409.07)</td>
<td>976.00 (468.05)</td>
<td>0.18</td>
<td>0.84</td>
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<tr>
<td>DASS Depression</td>
<td>23.07 (10.30)</td>
<td>19.93 (11.84)</td>
<td>19.53 (10.09)</td>
<td>1.89</td>
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<td>DASS Anxiety</td>
<td>13.07 (8.78)</td>
<td>11.76 (10.42)</td>
<td>11.60 (8.62)</td>
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<tr>
<td>DASS Stress</td>
<td>22.03 (9.75)</td>
<td>20.51 (10.91)</td>
<td>20.94 (9.90)</td>
<td>0.35</td>
<td>0.70</td>
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<tr>
<td>AUDIT</td>
<td>6.98 (6.27)</td>
<td>7.08 (7.73)</td>
<td>7.47 (5.15)</td>
<td>0.09</td>
<td>0.92</td>
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<tr>
<td>Brief COPE Active Coping</td>
<td>4.22 (1.77)</td>
<td>4.17 (1.71)</td>
<td>4.33 (1.65)</td>
<td>0.13</td>
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<td>Brief COPE Cognitive Coping</td>
<td>4.68 (1.92)</td>
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<tr>
<td>Brief COPE Emotion-focused Coping</td>
<td>3.45 (1.97)</td>
<td>3.43 (1.85)</td>
<td>3.69 (1.86)</td>
<td>0.33</td>
<td>0.72</td>
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<tr>
<td>Brief COPE Avoidance Coping</td>
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<td>3.46 (2.05)</td>
<td>3.64 (2.06)</td>
<td>0.67</td>
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<tr>
<td>QOLI</td>
<td>-14.42 (24.35)</td>
<td>-0.65 (20.82)</td>
<td>2.54 (20.76)</td>
<td>5.78</td>
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<tr>
<td>SWLQ</td>
<td>12.75 (4.86)</td>
<td>15.82 (6.89)</td>
<td>16.60 (7.03)</td>
<td>6.00</td>
<td>0.01</td>
<td></td>
</tr>
</tbody>
</table>
3.2 Attrition

Figure 1 shows a flowchart to track the participant flow and dropouts at each stage of the study. Seventy-two participants failed to complete the full course of treatment (38 from the I-CBT group, 34 the I-MFS group) and eleven participants failed to return wait-list data (non-significant group difference, $\chi^2 (2, N = 174) = 3.18, p = .20$). Reasons given for discontinuing were: computer /Internet problems (n=8), feeling that the location of their computer lacks privacy or is too noisy (n=7), feeling that the treatment was not useful for them (n=9), seeking treatment elsewhere (n=6), not having enough time for weekly sessions (n=6), worries about confidentiality of their information (n=1), not being ready to cease gambling (n=11), having stopped gambling (n=2), emotional difficulties (n=6), employment difficulties (n=4), legal difficulties (n=1), accommodation difficulties (n=1), family /relationship difficulties (n=2) and finding it too difficult or embarrassing to share their problems with gambling (n=3). Five participants did not provide a reason. These 72 participants who failed to complete the full course of treatment were compared with those who completed treatment. Only frequency of computer use and frequency of Internet use yielded a significant association with failure to complete. Participants who discontinued the treatment program used the computer ($F (1, 156) = 4.21, p < .05$) and Internet ($F (1, 155) = 5.05, p < .05$) less often than those who completed treatment.
Figure 1. Participant flow and dropouts at each stage of the study

Participants that registered online (n=462)

Completed randomisation (n=174)

Waitlisted (n=56)
- 45 completed
- 11 dropped out

Allocated to CBT (n=60)
Data returned =
- Mid = 38
- Post = 24
- 3 month = 21
- 6 month = 24
- 12 month = 18

Allocated to MFS (n=59)
Data returned =
- Mid = 39
- Post = 26
- 3 month = 24
- 6 month = 19
- 12 month = 17

Reasons for discontinuing
- Too busy (n=6)
- Sought treatment elsewhere (n=6)
- Computer and/or Internet difficulties (n=2)
- Emotional difficulties (n=1)
- Relocated (n=1)
- Stopped gambling without treatment (n=1)
- Did not wish to provide a reason (n=2)
- Uncontactable (n=194)
- Did not meet inclusion criteria (n=75)

Reasons provided by treatment dropouts
- Computer/Internet problems (n=8)
- Location of computer lacks privacy or is too noisy (n=7)
- Treatment not useful for them (n=9)
- Seeking treatment elsewhere (n=6)
- Not having enough time for weekly sessions (n=6),
- Worries about confidentiality of their information (n=1)
- Not ready to cease gambling (n=11)
- Stopped gambling (n=2)
- Emotional difficulties (n=6)
- Employment difficulties (n=4)
- Legal difficulties (n=1)
- Accommodation difficulties (n=1)
- Family/relationship difficulties (n=2)
- Finding it too difficult or embarrassing to share their problems with gambling (n=3)
3.4 Evaluation of Treatment Outcome

Multilevel analytic strategies are increasing being used by researchers to assess psychological treatment outcomes (Carlbring & Smit, in press). These approaches are not only more sophisticated than traditional multivariate techniques but as it is not necessary for each participant to have the same number of measurements the approach can encompass, and is less sensitive to, missing data (Singer & Willett, 2003). As a result, whilst we originally intended to apply multivariate techniques such as MANOVA, multilevel statistical modelling was used to analyse data for this report. The multilevel models were fitted with the MIXED procedure in SPSS version 17. The level of significance (alpha) was 0.05 was applied. Data from all 174 randomised participants was used in analyses. To evaluate treatment outcome, a time variable was first created that took on integer values between 0 (pre-treatment) and 6 (post-treatment). The three conditions were modelled using three dummy variables: one that contrasted waitlist with I-CBT (waitlist = 0, I-CBT = 1); one that contrasted waitlist with I-MFS (waitlist = 0, I-MFS = 1); and one that contrasted I-MFS with I-CBT (I-MFS =0, I-CBT). For gambling refusal self-efficacy (GRSEQ), quality of life (QOL) and satisfaction with life (SWLQ), a positive estimate represents improvement and a negative estimate represents a “worsening of symptoms”. For all other outcome variables, a negative estimate represents improvement and a positive effect size represented a “worsening of symptoms”. Table 4 reports the outcomes related to the interaction terms for each outcome variable. Mean scores for gambling outcome variables across time points for I-CBT, I-MFS and waitlist conditions are presented in Figure 2.
Table 4. Parameter estimates of multilevel modelling of treatment outcome

<table>
<thead>
<tr>
<th>Outcome Variable</th>
<th>Parameter</th>
<th>Estimate</th>
<th>SE</th>
<th>Significance</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
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<tr>
<td>GSAS</td>
<td>I-MFS vs WL*TIME</td>
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<td>0.01</td>
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<td></td>
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<td>I-CBT vs I-MFS*TIME</td>
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<td>I-CBT vs WL*TIME</td>
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<td>I-CBT vs I-MFS*TIME</td>
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<td>I-CBT vs I-MFS*TIME</td>
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<td>30.53</td>
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<td>DASS – Depression</td>
<td>I-MFS vs WL*TIME</td>
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<td>0.69</td>
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Table 4. Parameter estimates of multilevel modelling of treatment outcome (continued)

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<tr>
<th>Outcome Variable</th>
<th>Parameter</th>
<th>Estimate</th>
<th>SE</th>
<th>Significance</th>
<th>95% Confidence Interval</th>
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<td>SWLQ</td>
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<td>I-CBTvsI-MFS*TIME</td>
<td>0.45</td>
<td>0.37</td>
<td>0.23</td>
<td>-0.29</td>
</tr>
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</table>
Figure 2. Mean scores for gambling outcome variables across time points for I-CBT, I-MFS and waitlist conditions
3.3.1 I-CBT versus WL

The difference in treatment outcome between participants in the I-CBT condition compared to the waitlist condition is shown by the I-CBTvsWL*TIME interaction (Table 4). Compared to participants completing the waitlist control condition, participants completing I-CBT noted significantly greater reductions in gambling amount, gambling frequency, gambling severity (GSAS and SOGS), gambling urge (GUS), gambling related cognitions (GRCS), depression, anxiety and stress (DASS). They were also more likely to report increases in gambling refusal self-efficacy (GRSEQ), quality of life (QOLI), satisfaction with life (SWLQ) and use of emotion-focused coping strategies (Brief COPE). No significant differences between participants completing the waitlist control condition and participants completing the I-CBT condition were found with regards to changes in alcohol use (AUDIT), cognitive coping, avoidance coping or active coping (Brief COPE).

3.3.2 I-MFS versus WL

The difference in treatment outcome between participants in the I-MFS condition compared to the waitlist condition is shown by the I-MFSvsWL*TIME interaction (Table 4). Compared to participants completing the waitlist control condition, participants completing I-MFS noted significantly greater reductions in gambling severity (GSAS) and were more likely to note increased quality of life (QOLI). No significant differences between participants completing the waitlist control condition and participants completing the I-MFS were found with regards to gambling amount, gambling frequency, gambling severity (SOGS), gambling urge (GUS), gambling related cognitions (GRCS), depression, anxiety, stress (DASS), gambling refusal self-efficacy (GRSEQ), satisfaction with life (SWLQ), alcohol use (AUDIT), emotion-focused coping, cognitive coping, avoidance coping or active coping (Brief COPE).
3.3.3 I-CBT versus I-MFS

Difference in treatment outcome between participants in the I-CBT condition compared to the I-MFS condition is shown by the I-CBTvsI-MFS*TIME interaction (Table 4). Compared to participants completing the I-MFS condition, participants completing I-CBT noted significantly greater reductions in gambling urges (GUS), gambling related cognitions (GRCS) and stress. No significant differences between participants completing the I-MFS condition and participants completing the I-CBT condition were found with regards to gambling amount, gambling frequency, gambling severity (SOGS and GSAS), depression, anxiety, stress (DASS), gambling refusal self-efficacy (GRSEQ), satisfaction with life (SWLQ), quality of life (QOLI), alcohol use (AUDIT), emotion-focused coping, cognitive coping, avoidance coping or active coping (Brief COPE).

Participants in the I-CBT condition were significantly more satisfied with the program than those in the I-MFS condition ($F (1, 45) = 15.05, p < 0.01$). Treatment satisfaction in the I-CBT had a mean score of 4 (SD = 0.89) indicating that participants were on average very much satisfied with the treatment program. In I-MFS, the mean score treatment satisfaction was 2.73 (SD = 1.31) indicating that participants were on average moderately satisfied with the treatment program.

3.3.4 Maintenance of Treatment Gains

Pre to post treatment changes associated with I-CBT (reductions in gambling amount ($\beta= 0.10, SE = 2.35, p=0.96$), gambling frequency ($\beta= 0.01, SE = 0.02, p=0.53$), SOGS gambling severity ($\beta= 0.02, SE = 0.50, p=0.66$), gambling urge ($\beta= 0. 02, SE = 0.05, p=0.72$), gambling related cognitions ($\beta= 0.03, SE = 0.22, p=0.88$), depression ($\beta= 0.11, SE = 0.11, p=0.31$), anxiety ($\beta= -0.04, SE = .06, p=0.54$) and stress ($\beta= -0.07, SE = 0.09, p=0.46$) were maintained across 3-, 6- and 12-month follow-up assessments. Increases in gambling refusal
self-efficacy ($\beta = 11.05$, $SE = 6.13$, $p=0.09$), quality of life ($\beta = 0.38$, $SE = 0.41$, $p=0.37$), satisfaction with life ($\beta = -0.01$, $SE = 0.08$, $p=0.92$) and use of emotion-focused coping strategies ($\beta = -0.02$, $SE = 0.02$, $p=0.24$) were also maintained across 3-, 6- and 12-month follow-up assessments. Within the I-MFS condition, increases in quality of life ($\beta = -0.09$, $SE = 0.35$, $p=0.80$) and reductions in gambling severity ($\beta = 0.08$, $SE = 0.40$, $p=0.89$) were maintained across 3-, 6- and 12-month follow-up assessments.

3.4 Predictors of Treatment Outcome

The relationship between several pre-treatment variables (depression, alcohol use, gambling severity, age and number of sessions completed) and change in gambling outcome variables was also explored. Using multilevel statistical models the salience of these pre-treatment variables in predicting outcome was given by the interaction between each specific predictor variable, the specific treatment dummy variable and the time variable.

3.4.1 Predictors of Treatment Outcome within I-CBT

Depression: No significant associations were found between pre-treatment depression and change in gambling amount ($p = 0.83$), gambling frequency ($p = 0.78$), SOGS gambling severity ($p = 0.21$), gambling related cognitions ($p = 0.58$), gambling refusal self-efficacy ($p = 0.39$), GUS ($p = 0.40$) or GSAS gambling symptom severity ($p = 0.54$).

Alcohol Use: No significant associations were found between pre-treatment alcohol use and change in gambling amount ($p = 0.88$), gambling frequency ($p = 0.66$), SOGS gambling severity ($p = 0.63$), gambling related cognitions ($p = 0.72$), gambling refusal self-efficacy ($p = 0.29$), gambling urge ($p = 0.74$) or GSAS gambling symptom severity ($p = 0.11$).

Gambling Severity: The results indicated that higher pre-treatment gambling severity (pre-treatment SOGS) was significantly associated with less change in gambling urge ($p < 0.01$). No significant associations were found between pre-treatment gambling severity and
change in gambling amount (p = 0.43), gambling frequency (p = 0.38), SOGS gambling severity (p = 0.49), gambling related cognitions (p = 0.10), gambling refusal self-efficacy (p = 0.21) and GSAS gambling symptom severity (p = 0.37).

Age: Older age was significantly associated with less change in GRSEQ (p <0.05).
No significant associations were found between age and change in gambling amount (p = 0.86), gambling frequency (p = 0.29), SOGS gambling severity (p = 0.88), gambling related cognitions (p = 0.20), gambling urge (p = 0.67) and GSAS gambling symptom severity (p = 0.29).

Number of Sessions Completed: An increased number of sessions completed was significantly associated with increased change in gambling related cognitions (p <0.05). No significant associations were found between number of sessions completed and change in gambling amount (p = 0.89), gambling frequency (p = 0.31), SOGS gambling severity (p = 0.56), gambling refusal self-efficacy (p = 0.74), gambling urge (p = 0.71) and GSAS gambling symptom severity (p = 0.89).

3.4.2 Predictors of Treatment Outcome within I-MFS

Depression: No significant associations were found between pre-treatment depression and change in gambling amount (p = 0.81), gambling frequency (p = 0.76), SOGS gambling severity (p = 0.70), gambling related cognitions (p = 0.54), gambling refusal self-efficacy (p = 0.76), gambling urge (p = 0.63) or GSAS gambling symptom severity (p = 0.36).

Alcohol Use: No significant associations were found between pre-treatment alcohol use and change in gambling amount (p = 0.89), gambling frequency (p = 0.28), SOGS gambling severity (p = 0.70), gambling related cognitions (p = 0.25), gambling refusal self-efficacy (p = 0.92), gambling urge (p = 0.39) or GSAS gambling symptom severity (p = 0.67).
Gambling Severity: Higher pre-treatment gambling severity (pre-treatment SOGS) was significantly associated with less change in gambling severity (SOGS) across treatment (p < 0.05). No significant associations were found between pre-treatment gambling severity and change in gambling amount (p = 0.51), gambling frequency (p = 0.12), gambling related cognitions (p = 0.14), gambling refusal self-efficacy (p = 0.14), gambling urge (p = 0.15) and gambling symptom severity (p = 0.21).

Age: Older age was significantly associated with less change in gambling refusal self-efficacy (p < 0.05). No significant associations were found between age and change in gambling amount (p = 0.69), gambling frequency (p = 0.49), gambling severity (SOGS :p = 0.51 GSAS: p = 0.88), gambling related cognitions (p = 0.15) and gambling urge (p = 0.57).

Number of Sessions Completed: Higher number of sessions completed was significantly associated with higher change in gambling related cognitions (p < 0.05). No significant associations were found between number of sessions completed and change in gambling amount (p = 0.79), gambling frequency (p = 0.46), SOGS gambling severity (p = 0.76), gambling refusal self-efficacy (p = 0.65), gambling urge (p = 0.51) and GSAS gambling symptom severity (p = 0.80).

3.5 Internet-based CBT compared to face-to-face CBT for pathological gambling

The effect size for change from pre- to post in gambling amount, gambling frequency, gambling urge, gambling-related cognitions and gambling refusal self-efficacy were contrasted between the Internet-based CBT program and the face to face CBT program. The effect size for change was calculated as the mean change divided by the standard deviation of change (Cohen’s $d$). For gambling amount, gambling frequency, gambling urge and gambling-related cognitions, a positive effect size represented improvement and a negative effect size represented a “worsening of symptoms”. With regards to gambling refusal self-
efficacy, a negative effect size represented improvement and a positive effect size represented a “worsening of symptoms”. An effect size of 0.20 is generally considered a small effect size, 0.50 a medium effect size and 0.80 or more a large effect size (Wilkenson, 1999). Ninety-five percent confidence intervals were computed. Comparisons were made based on those confidence intervals. If the effect size of one treatment type was not included within the 95% confidence interval of the other treatment then the two treatments differed significantly at $p < .05$.

As shown in Table 5 the Internet-based CBT program and the face to face CBT program were equally effective in producing improvements in gambling amount, gambling frequency, gambling urge and gambling refusal self-efficacy across treatment. However, the face-to-face CBT program (95% CI -2.40 to -1.19) was more effective in producing improvement in gambling related cognitions than the Internet-based CBT program (95% CI -1.84 to -1.03).

Table 5. Change in outcome measures from pre- to post-treatment in Internet-based CBT program and the face to face CBT.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Internet-based CBT for pathological gambling</th>
<th>Face-to-face CBT for pathological gambling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Change</td>
<td>Effect Size</td>
</tr>
<tr>
<td>Gambling Amount</td>
<td>368.00</td>
<td>0.43</td>
</tr>
<tr>
<td>Gambling Frequency</td>
<td>3.10</td>
<td>1.66</td>
</tr>
<tr>
<td>GUS</td>
<td>10.50</td>
<td>1.09</td>
</tr>
<tr>
<td>GRCS</td>
<td>35.34</td>
<td>1.25</td>
</tr>
<tr>
<td>GRSEQ</td>
<td>-858.00</td>
<td>-1.45</td>
</tr>
</tbody>
</table>

GUS = Gambling Urge Scale; GRCS = Gambling Related Cognitions Scale; GRSEQ = Gambling Refusal Self Efficacy Questionnaire
CI = Confidence Interval
Section 3: Discussion

The first aim of this project was to evaluate Internet-based CBT and Internet-based MFS for pathological gambling. It was hypothesised that participants completing Internet-based CBT would demonstrate significantly greater reductions in gambling behaviours than participants in a waitlist condition at post-treatment. Our results suggest that Internet-based cognitive behavioural treatment holds particular promise for the treatment of pathological gamblers. There was a significant improvement in all problem gambling behaviours (i.e., gambling amount, gambling frequency, gambling severity) as well as the majority of gambling correlates (i.e., gambling urge, gambling cognitions, gambling refusal self-efficacy, depression, anxiety, stress, quality of life and satisfaction with life) from pre- to post-treatment for I-CBT compared to the wait list condition. Improvements were maintained for all variables at 12-month follow-up. These results support previous studies that have shown that CBT can significantly improve problematic gambling symptoms (Ladouceur et al., 2001; Arribas & Martinez, 1991; Sylvain et al., 1997) and suggest that delivery of CBT via the Internet provides a viable treatment option.

We also hypothesised that participants completing Internet-based MFS would demonstrate significantly greater reductions in gambling behaviours than participants in a waitlist condition at post-treatment. Our results suggest that in general Internet-based monitoring, feedback and support did not differ from control in the treatment of pathological gamblers. Significant improvements compared to waitlist were noted less often in I-MFS than I-CBT across the full range of outcome variables. In particular, compared to participants completing the waitlist control condition, participants completing I-MFS noted significant improvements only in gambling severity and quality of life. These results suggest that a brief intervention consisting of monitoring, feedback and support delivered via the Internet, is a
less effective treatment for pathological gambling. It remains possible, however, that the I-MFS condition may assist individuals who do not meet criteria for pathological gambling but experience some problems with gambling. Similarly, it is possible that such an intervention may provide a useful adjunct in relapse prevention. Further research is warranted into the role of brief interventions delivered via the Internet that provide monitoring, feedback and support.

This project also aimed to contrast the effectiveness of Internet-based CBT for pathological gambling and Internet-based MFS for pathological gambling. It was hypothesised that participants completing Internet-based CBT would demonstrate a significantly greater reduction in gambling behaviours in comparison to participants completing Internet-based MFS at post–treatment and follow-up. Our results suggested that the effects of Internet-based CBT were more than simply the non-specific effects expected as a result of engaging in treatment. In particular, there was more significant improvements associated with I-CBT than with I-MFS compared to waitlist across the full range of outcome variables. Comparison of the two active treatment conditions showed participants completing I-CBT achieved significantly greater reductions in gambling urges (GUS), gambling related cognitions (GRCS) and stress than those completing I-MFS. Participants completing I-CBT were also more satisfied with the treatment program than those in the I-MFS condition.

Although beyond the scope of the original project, we also elected to explore the association between pre-treatment variables and outcome in Internet-based treatment for pathological gambling. The pre-treatment variables examined included: depression, alcohol use, gambling severity, number of sessions completed and age. Consistent with prior research (Crisp, et al., 2001), a higher number of sessions completed was significantly associated with treatment outcome. Significant relationships were found between change in gambling related cognitions and number of sessions completed in I-CBT and I-MFS. Arguably, the more
treatment sessions that a client has completed the more opportunity they have had to make positive changes in their gambling behaviour and challenge their gambling related cognitions. Age was also found to be associated with treatment outcome. Significant relationships were found between less positive change in gambling refusal self-efficacy and older age in I-CBT and I-MFS. In principle, pathological gamblers of an older age may have had a longer duration of gambling behaviour, may have more entrenched difficulties and may have had previous unsuccessful treatment experiences. They may therefore require more time and effort in treatment to produce change and may be more likely to report less positive change in gambling refusal self-efficacy than younger participants.

Pathological gamblers with more severe difficulties may also require more time and effort in treatment to produce change; they may have had unsuccessful treatment experiences in the past; and they may be more likely to be experiencing comorbid psychological difficulties which may complicate treatment. As a result, such individuals may be more at risk of poorer outcomes because they may be more likely to become discouraged with the treatment process. Importantly, results indicated that the association between gambling severity and treatment outcome was specific to the treatment condition. Although higher pre-treatment gambling severity predicted less change in gambling urge across treatment in I-CBT, there was no association between pre- and post treatment gambling severity, whereas within I-MFS higher pre-treatment gambling severity was associated with less change in gambling severity across treatment.

There was no association between pre-treatment depression and alcohol use with treatment outcome. Although there is some evidence in the literature that comorbid psychological conditions may influence treatment outcome amongst pathological gamblers (Hodgins, Peden, & Cassidy, 2005) other researchers have also reported no association between and comorbid psychological conditions and gambling treatment outcome.
(Stinchfield, Kushner, & Winters, 2005; Toneatto, Skinner, & Dragonetti, 2002). As noted previously, the only other Internet-based treatment for pathological gambling actively excluded participants with severe depression. The results obtained in this project suggest that excluding pathological gamblers with comorbid depression or alcohol use is not necessary and that these participants are equally likely to benefit from Internet-based treatment.

Our comparison of effect sizes obtained in Internet-based CBT and face-to-face CBT provides preliminary evidence that both treatments may be similarly effective in the treatment of pathological gambling, although a more stringent examination of this hypothesis involving random allocation of participants to either face to face or Internet-based CBT would clearly be desirable. Comparison between the two forms of intervention has a number of important implications. Internet-based treatment has a number of characteristics that overcome some of the disadvantages of face-to-face treatment. For instance, Internet-based treatment can be more accessible, cost-effective, available and convenient than face-to-face treatment. Internet-based treatment may also overcome barriers such as shame, embarrassment and fear of stigma that may prevent gamblers from seeking face-to-face help. Importantly, utilizing an evidence based treatment approach in design of the Internet-based treatment as we did in this project ensures that individuals are actually receiving an intervention based on best practice principles, rather than a generic counselling approach that is of unknown benefit. Conversely, face-to-face treatment does have its own advantages, such as the one to one contact with a therapist and a secure environment where it is often easier to disclose sensitive information which might not otherwise be ideal to discuss in an Internet-based format. Again, it should be noted that these advantages of face to face contact can only be argued to be maximised if an evidence-based approach such as CBT is used. In our preliminary comparison undertaken for the purposes of this report, the face-to-face CBT program appeared to be more effective in producing improvement in gambling related cognitions than the Internet-based CBT program.
Face-to-face CBT may provide clients with more opportunities and assistance in expressing, exploring and challenging gambling related cognitions. Given evidence of a link between higher levels of gambling related cognitions and relapse (Oei & Gordon, 2008), it may be useful in subsequent adaptations of treatment for delivery via the Internet to look at ways of augmenting work with cognitions. The *Improving the Odds* program can be considered as a core component of an Internet-based intervention that can be added to in a number of ways. Applications that may augment work with cognitions may include: extending didactic work on the role of cognitions, providing additional therapist contact (either online via chat or telephone or face to face contact) or including peer support forums such as discussion boards.

Seventy-two participants failed to complete treatment. This overall rate of dropout (41%) is comparable that reported previously regarding the extent of dropout from pathological gambling treatment programs and the extent of dropout from Internet-based treatment programs for psychological disorders. For instance, a recent review found that on average 31% of participants drop out of pathological gambling treatment programs (Melville, Casey, & Kavanagh, 2007; Stark, 1992). Similarly, it has been reported that on average 35% of participants drop out of Internet-based treatment programs for psychological disorders (Melville, Casey, & Kavanagh, Submitted). Clients who dropped out provide a range of reasons for discontinuing treatment. Reasons related to logistical (e.g., work commitments, computer /Internet difficulties, legal difficulties, accommodation difficulties), psychological (e.g., emotional difficulties, not ready to cease gambling, embarrassment) and treatment (e.g., feeling that the treatment is not useful) difficulties. However, despite this heterogeneity, one variable was found to reliably discriminate between dropouts and completers. Participants who dropped out from treatment sessions used the computer or Internet less often than completers. As noted earlier, Internet access is accelerating at an exponential rate in Australia and use of the Internet across an increasingly broad range of activities is likely to increase.
With increasing penetration of this form of technology, it seems likely that more and more Australians will find themselves making use of the Internet on a daily basis. In turn, this increased usage of Internet may ultimately mean that clients are less likely to discontinue treatment because of reduced use of a computer or the Internet.

Fifty-four per cent of participants in this study had not previously sought professional help for gambling. The only other study to examine previous help-seeking in an Australian context that we are aware of is that reported by Evans & Delfabbro (2005), who reported that only 21% of their sample had never sought treatment previously. It is therefore possible that by increasing the accessibility and ease with which gamblers can attend psychological treatment, the Internet-based program may have engaged clients who would be reluctant to participate in face-to-face treatment. Such clients may be unsure as to whether they want to change their gambling behaviour; may be experiencing co-morbid psychological, medical, health or social difficulties which create a barrier to treatment entry; or they may be hesitant about participating in face-to-face treatment due to embarrassment, shame or unsuccessful treatment experiences in the past and may therefore be at a higher risk for terminating treatment.

A number of limitations must be noted. Firstly, participants were required to have access to the Internet in order to complete the program and so arguably this requirement may have resulted in a less representative sample of pathological gamblers. Secondly, as participants on the waitlist, for ethical reasons, received treatment before follow-up data was collected, there were no comparisons between the waitlist control group and the active treatment conditions at follow-up. It is important to remember that pathological gambling does not always follow a persistent course and that a proportion of individuals with a history of pathological gambling may eventually recover without treatment. However, the use of an active control condition (i.e., the I-MFS condition) enabled comparison of the effects of I-
CBT across the follow-up period, and suggested that the specific effects of this treatment maintain across time.

In summary, the results of this project suggest that the Internet can be used to effectively provide treatment to pathological gamblers. CBT delivered via the Internet was shown to be significantly more effective than waitlist control in improving problem gambling behaviours (i.e., severity, amount and frequency) and problem gambling correlates (e.g., depression, anxiety, stress, satisfaction with life, quality of life, gambling cognitions and gambling urges). In addition, use of an active treatment control condition suggests that the effects of I-CBT cannot simply be attributed to non-specific effects associated with engaging in treatment. Treatment gains associated with both I-CBT and I-MFS were sustained across a twelve month follow-up period. Although we were able to establish that neither depression or alcohol use influenced treatment outcome associated with either I-CBT and I-MFS, more research is required in order to determine which individuals are most likely to benefit from Internet-based treatment. Increased accuracy of predicting which individuals are most likely to benefit from this form of treatment delivery may further increase the impact of Internet-based psychological interventions in the gambling field. Finally, it would be useful to examine the effects of extending Internet-based treatment to less severely affected individuals and to explore the ways in which I-CBT could be used and augmented to further boost current treatment options available to individuals with gambling problems in Australia.
References


Melville, K. M., Casey, L. M., & Kavanagh, D. J. (Submitted). Dropout from Internet-based Treatment for Psychological Disorders.


Appendix 1. WebPages from I-CBT.

Objectives

In this first session, I will:

- Introduce the program - structure and format
- Help you increase your awareness of factors that may be playing a role in why you started gambling and why you continue to gamble despite the losses
- Provide strategies to stabilise your gambling

Introduction of the program

This program uses Cognitive Behavioural Therapy (CBT) to provide treatment for individuals who are experiencing difficulties in controlling their gambling.

Why CBT for problem gambling?

CBT has been widely used and has shown to be effective for a range of psychological disorders including depression and anxiety. Although a number of things, including cognitive, behavioural, psychodynamic, multimodal, pharmacotherapy and 12 step approach, have been used to treat gambling problems, CBT appears to be most effective (Laing & Schram, 1999; Schram, Ladouceur & Bouvard, 1997; Russell, Ladouceur, Schram & Bouvard, 1996). CBT emphasizes the importance of changing unhelpful beliefs, thoughts and behaviours to help reduce the frequency and severity of gambling.

We aim to provide strategies and to assist individuals develop skills to change their gambling behaviours. In this session, we will be providing you with information regarding problem gambling and some basic skills to stabilise your gambling. The subsequent sessions will be focusing on cognitive and behavioural strategies to...

Understanding your gambling habits

It is important to understand and to become aware of your gambling patterns. This can be achieved by understanding how your problem gambling may have started and more importantly understanding why you have continued gambling despite the losses.

All about gambling

1. The nature of your gambling problems

- Gamblers exist on a continuum and we all lie somewhere on the continuum.

- Problem gambling is chronic especially when it becomes pathological. Sometimes it gets better and sometimes it gets worse.

- The urge to gamble usually increases with stress. As problem gambling develops, it may either increase existing anxiety and depressive symptoms or it may lead to the development of symptoms of anxiety and depression.

- Similarities between gambling addiction and other substance addictions

- Gambling is as addictive as alcohol and drug use. There are three wars in which gambling addiction is...
Case Example 1

Samuel grew up in an environment where gambling is a regular family activity. Several of his relatives work as bookies, punters and bookmakers. Many of his friends gamble regularly too. In Samuel’s case, the social and environmental risk factors, and the social interactions he gets when he gambles play major roles in the development of his gambling problems.

Case Example 2

Erica has just moved to Brisbane recently. With her family and friends still living in Perth, she often feels lonely and bored. Erica has started going to the local club to play the pokies. Gradually, she finds herself rushing off to play the pokies more frequently. Erica’s recent move to Brisbane, her negative mood states and boredom play major roles in the development of her gambling problems.

‘Which of these reasons apply to you?’

Why did I start gambling?
- Biological risk factors
- Social and environmental risk factors
- Life experiences or benefits that you obtain from gambling
  - Daily problems or negative mood states
  - Lack of stimulation/boredom
  - Financial loss
  - Major Life events
  - Relationship problems
  - Social interaction
  - First experience with gambling

Dealing with strong urges to gamble

It can be difficult to avoid triggers that may set off your gambling session (e.g., meeting someone who gambles). Sometimes urges may occur for no obvious reasons. Urges can build up to a level where it feels so unbearable that you feel you have to give in to your urge.

Behavioural Techniques

- Ensure that you have cash control procedures (as discussed above) in place
- It is easier to avoid triggers for gambling when you have other pleasurable activities planned. E.g., going to the gym and meeting a friend for dinner.
- Delay your decision to gamble for one hour. Many urges don’t last longer than an hour. Urges are like stray cats. If you feed them by gambling, they will keep coming back. If you don’t feed them, ultimately they will stop coming.
- Flashcards/ Cue cards – Some people have found it useful to put together coping statements and write them on 3” by 5” index cards.

Some examples are

- I have already lost so much money and if I continue gambling, there are no guarantees that I will win
- I have been able to stop gambling before, I can do it again!
- Stop and Think

- Distraction: Do things to distract yourself when the urge occurs.
Aim and rationale

Thoughts affect the way we act and feel. Unhelpful thinking patterns related to gambling can make you start gambling or lead to relapse (i.e., going back to the original gambling habits). Research has indicated that it is not the events (triggers) that cause certain emotional change (e.g., feeling depressed or guilty) or behaviours (e.g., gambling). It is the automatic thoughts that make us feel and behave in a certain way.

What are automatic thoughts?

- **Activating event**: Situations / behaviours, feelings
- **Belief thought**: What goes through one’s mind
- **Consequences**: Behavioural: How one behaves in response to his/her thoughts in the situation; Emotional: How one feels in the situation

Internal triggers: e.g., feelings such as guilt
External triggers: e.g., going past a casino and having lunch in a club

Now it’s your turn to practice connecting thoughts, feelings and behaviours.

**Case Example**

Simon, who is Amanda’s neighbour, was running late for work this morning. He grabbed his bag, ran out the front door and down the footpath to the train station. Just as he got near the train station, he stopped in a pile of dog poo.

**Reasoning**

- These things happen to me! I am always unlucky!
- I have to go home and change my shoes. This will make me really late and my supervisor will yell at me for being late!
- Oh no, now I have to go back and change my shoes.

1. Because Simon was thinking like this, he felt...
   - really confident
   - really anxious
   - really angry
Appendix 2. WebPages from I-MFS.

Session 1
Welcome! My name is Jessica Chu. I will be your therapist for the duration of this treatment program.

If you have any difficulties or queries, you can email me on: therapi@improvingtheodds.com.au

At the beginning of each week, you will be asked to fill out an online questionnaire about your gambling habits. I will be using your results on this questionnaire to monitor your progress and give you feedback. Let's start by getting a measure of how your gambling has been going over the last week.

Gambling Symptom Assessment Scale
The following questionnaire is aimed at evaluating gambling symptoms. Please read the questions carefully before you answer.

1. If you had urges to gamble during the past WEEK, on average, how strong were your urges?
   - extreme
   - moderate
   - mild
   - no

2. During the past WEEK, how many times did you experience urges to gamble?
   - constant or near constant
   - moderate
   - mild
   - no

3. During the past WEEK, how many hours (add up hours) were you preoccupied with your urges to gamble?
   - over 21 hr
   - 10-20 hr
   - 5-9 hr
   - 1-4 hr
   - no

4. During the past WEEK, how much were you able to control your urges?
   - no control
   - moderate control
   - good control
   - excellent control

5. During the past WEEK, how often did thoughts about gambling and placing bets come up?
   - constant or near constant
   - moderate
   - mild
   - no

6. During the past WEEK, approximately how many hours (add up hours) did you spend thinking about gambling and thinking about placing bets?
   - over 21 hr
   - 10-20 hr
   - 5-9 hr
   - 1-4 hr
   - no

7. During the past WEEK, how much were you able to control your thoughts about gambling?
   - no control
   - moderate control
   - good control
   - excellent control
Feedback

The graphs we will be displaying are based on the information you've been providing us so far. Scroll down the page to see how you've been doing.

**REMEMBER**

Total amount spent per day averaged over the last 2 weeks

This is how you've been going in terms of the average amount of money you spent on gambling each day.

Feedback

We notice from the information you have provided us that not everything has been going as planned for you this past week. You may be feeling a little discouraged. However, it is crucial that you don't lose heart at this stage. Many people have to have a few goes before they succeed. To overcome this problem, it is important to stick with the program and just keep on trying.

BACK NEXT