An Examination of Cognitive Behavioural Group Therapy for Problem Gamblers who Gamble

over the Internet: A Controlled Study

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Abstract

The purpose of the present study was twofold: first, to examine the efficacy of group CBT for self-identified problem Internet gamblers and second, to qualitatively examine participants' perspectives on their treatment experiences, especially in relation to decreasing Internet problem gambling. Thirty-two self-identified problem Internet gamblers were randomly assigned to either the treatment group ($n = 16$) or wait-list control group ($n = 16$). Results indicated that the treatment was efficacious in improving three of the four dependent variables from pre- to post-test/treatment: number of *DSM-IV* criteria for pathological gambling endorsed, perception of control over gambling, and number of sessions gambled. No significant pre- to post-test/treatment difference was found between groups on desire to gamble. Groups were combined to examine treatment outcome over time, with results showing significant pre- to post-treatment and pre- to three-month post-treatment improvement in all four dependent variables. For the qualitative component of this study, thematic analysis was used to identify themes in the data. Five themes related to participants' treatment experiences, experiences in trying to decrease their problem gambling behaviours over the Internet, and how Internet gambling may influence the treatment of problem gambling behaviours were identified. Limitations of the study, along with implications for future research are discussed.

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Historically, societies worldwide have undergone significant changes in access to legal

gambling. In Canada, for example, the federal government of Canada amended the criminal code

to include a ban on all gambling activities in 1892. However, over the course of the century,

more and more forms of gambling became legal, and today various types of gambling

opportunities are available all over the country. In 2010, the Canadian government had a net

revenue of 13.7 billion Canadian dollars generated from government-run lotteries, video-lottery

terminals (VLTs), and land-based casinos, a number that increased from 2.7 billion in 1992

(Statistics Canada, 2011). It seems that legalized gambling has embedded itself into everyday

Canadian culture. Canada is not alone however, as gambling has become a global phenomenon.

Governments worldwide profit from numerous forms of gambling that include land-based

casinos, scratch tickets, lotteries, VLTs, bingos, horse racing, and sports betting.

In particular, access to legalized gambling has increased substantially over the last two

decades. This has occurred, not only because of increases in traditional means of gambling (e.g.,

land-based casinos, VLTs), but also because of the introduction of an alternative means of

gambling: the Internet. Moreover, advertisements promoting gambling activities have reached an

all time high. The Ontario Lottery and Gaming Corporation has an annual marketing and

promotion budget of over $85 million dollars for their five casinos and slot machines at

racetracks alone (Ontario Lottery and Gaming Corporation, 2010). Increases in gambling access

and advertising have inevitably led to increases in both the social acceptance of gambling

activities and, more importantly, increases in gambling participation (Cox, Yu, Afifi, &

Ladouceur, 2005; Monaghan, Derevensky, & Sklar, 2008; Zangeneh, Blaszczynski, & Turner,

2008). Prevalence studies show that over 80% of Canadian adults gamble to some extent (Zangeneh et al., 2008) and although the majority of people who gamble do so with little, if any, adverse effects, prevalence rates of problem gambling in Canada have been found to be approximately 3% of the population (Wood & Williams, 2009).

Gambling Participation and Problem Gambling

Gambling participation can be viewed dimensionally as ranging from non-gambler, to social or recreational gambler, to problem gambler, to pathological gambler. For most individuals, gambling is a social or recreational activity that they can engage in without encountering any negative consequences. However, for some individuals, gambling can become a problematic activity. This is referred to as problem gambling, or to a more severe extent, pathological gambling. These individuals may lose control over their gambling behaviours and hide their gambling from others, thus making it difficult to identify (Horch & Hodgins, 2008; Steiker, 2008). The engagement in problem or pathological gambling may directly or indirectly lead to adverse effects that can include excessive debt, job loss, social isolation, family stress, divorce, or suicide (Griffiths, 2003; Shaffer, Hall, & Vander Bilt, 1999).

Ferris and Wynne (2001) define problem gambling as "gambling behaviour that creates negative consequences for the gambler, others in his or her social network, or for the community" (p. 7). Studies examining problem gambling have typically administered the South Oaks Gambling Screen (SOGS), a self-report questionnaire that uses a cut-off score to classify problem gamblers (Lesieur & Blume, 1987). In more recent years, additional problem gambling measures have been developed. The Canadian Problem Gambling Index (CPGI) has become a commonly administered questionnaire in problem gambling studies. The CPGI provides a

comprehensive evaluation of individual gambling behaviour and degree of problem gambling severity (Ferris & Wynne, 2001).

The *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*; American Psychiatric Association, 1980) first included pathological gambling as a mental disorder in 1980, allowing for a more formal set of diagnostic criteria for the psychological assessment of pathological gambling behaviour. To measure pathological gambling behaviours, the National Opinion Research Center *DSM-IV* Screen for Gambling Problems (NODS) was developed based on the *DSM-IV* criteria for pathological gambling (Gerstein et al., 1999). The 4th edition of the *DSM* (*DSM-IV-TR*) classified pathological gambling as an Impulse-Control disorder, defining it as a "persistent and recurrent maladaptive gambling behaviour (Criterion A) that disrupts personal, family, or vocational pursuits" (p. 671). These patterns of behaviour may include a preoccupation with gambling (Criterion A1), a pattern of gambling with increasing amounts of money in order to reach desired excitement levels (Criterion A2), repeated unsuccessful attempts to control their gambling behaviours (Criterion A3), restlessness or irritability when trying to cut back or stop gambling (Criterion A4), the use of gambling to escape problems or to elevate mood (Criterion A5), gambling to win back previous losses (Criterion A6), lying to others to hide gambling behaviours (Criterion A7), engaging in criminal behaviour in order to gain money for gambling behaviours (Criterion A8), gambling negatively impacts a significant relationship or career opportunity (Criterion A9), and dependence on others for money to relieve debt caused by gambling (Criterion A10).

Since the publication of *DSM-IV-TR* in 1994, researchers and clinicians have identified several limitations with the diagnostic label, classification, and criteria for pathological gambling (Petry et al, 2014; Reilly & Smith, 2013). As a result, the 5th and current edition of the *DSM*

(American Psychiatric Association, 2013) has made several changes to this diagnosis. First, due to the perceived stigma associated with the word "pathological" this diagnosis has been relabelled as "gambling disorder". Second, gambling disorder has been reclassified from an Impulse-Control disorder to a Substance-Related and Addictive Disorder, due to the growing evidence that problems with gambling are more closely related to substance use disorders than other impulse-control disorders (e.g., trichotillomania, pyromania). Third, *DSM-V* includes some changes in diagnostic criteria; most notably the elimination of the criterion "has committed illegal acts such as forgery, fraud, theft or embezzlement to finance gambling". Low prevalence of this criterion was stated as the rationale for this change. Fourth, the threshold of meeting a diagnosis of gambling disorder has been lowered from five of ten criteria to four of nine criteria. The rationale for this change was research indicating improved classification accuracy (e.g., Denis, Fatséas, & Auriacombe, 2012). Fifth, to better capture the severity of problem gambling, the *DSM-V* introduced a severity specification component based on the number of gambling disorder criteria endorsed: mild (4-5 criteria), moderate (6-7 criteria), and severe (8-9 criteria). Lastly, *DSM-V* has added the requirement that at least four gambling disorder criteria must be met within a 12-month period, in contrast to the *DSM-IV*, which did not provide a time period. The lifetime prevalence rates for gambling disorder in the general population range from 0.4% to 1% of adults; with higher prevalence typically being reported in males (American Psychiatric Association, 2013). To be consistent with the majority of papers published in the field, the current dissertation will use the term problem gambling to refer to both problem and pathological gambling behaviours.

The Development of Problem Gambling

To date, research has identified numerous environmental, psychological, and biological factors that may play a role in the development and maintenance of problem gambling behaviours (Blaszczynski & Nower, 2002; Hardoon & Derevensky, 2002). Although the specific causes of problem gambling are unknown, it is likely the case that individuals develop gambling problems for different reasons.

Environmental factors. Individuals who begin to gamble during their youth are more likely to engage in problem gambling in adolescence and into adulthood (Chambers & Potenza, 2003). Moreover, youth who grow up with parents who gamble are more likely to go on to develop gambling problems. This finding may be the result of youth modeling parental gambling behaviours (Felsher, Derevensky, & Gupta, 2003; Jacobs, 2000).

Environmental stressors or increased exposure to gambling activities may also play a role in the development of problem gambling behaviours (American Psychiatric Association, 2013). Often times, individuals may engage in long periods of social gambling without engaging in any problem gambling behaviours. However, an abrupt episode of problem gambling behaviours may occur following a period of stress (e.g., financial problems) or a period of increased exposure to gambling activities (e.g., numerous trips to the casino).

Psychological factors. Problem gambling and problem gambling relapse have been found to be associated with an inability to manage stressful situations (Ledgerwood & Petry, 2006) and poor coping skills (Sharpe & Tarrier, 1993; Shepherd & Dickerson, 2001). Problem gamblers have been found to score higher than non-problem gamblers on several self-report measures of personality dimensions, including impulsivity, distractibility, risk taking, sensation-seeking, poor self-discipline, and competitiveness (Gupta, Derevensky, & Ellenbogen, 2006;

Hardoon & Derevensky, 2002; Harris, Newby, & Klein, 2013; Jacobs, 2000; Kim & Grant,

2001). Problem gamblers are often quick to discount rewards and carry out decision-making

tasks haphazardly (Bechara, 2003; Petry & Casarella, 1999). Goudriaan, Oosterlaan, de Beurs,

and Van Den Brink (2006) found that a group of problem gamblers were more likely than a

control group to show diminished performance on various neurocognitive tests including tests of

inhibition, cognitive flexibility, and planning tasks.

Cognitive distortions related to games of chance, such as skill misperceptions, illusions of

control, selective memory, and superstitious beliefs have been found to be more common among

problem gamblers than non-problem gamblers (Toneatto, 1999). These cognitive distortions are

believed to contribute to the development and maintenance of problem gambling behaviours for

some individuals (Cunningham, Hodgins, & Toneatto, 2014; Myrseth, Brunborg, & Eidem,

2010). Cognitive distortions, or erroneous perceptions of control over games of chance, may

contribute to excessive gambling activities for many problem gamblers even though these

individuals continue to lose money.

Biological factors. There is a growing body of literature that suggests neurotransmitters

may be associated with problem gambling behaviours (e.g., noradrenaline, serotonin, dopamine).

Noradrenaline causes autonomic arousal (e.g., heart rate elevations) which has been found to be

increased in problem gambling males engaged in gambling activities, but not in non-problem

gambling males engaged in gambling activities (Meyer et al., 2004). This suggests that male

problem gamblers become more excited when engaged in gambling activities. Serotonin is

associated with mediation of impulse control, and as a result, has been hypothesized as being

involved with impulse dysfunction in problem gamblers. However, studies have found mixed

results examining serotonin levels and individual differences among problem gamblers (Potenza,

2008). Nordin and Eklundh (1999) found that when problem gamblers were administered serotonergic drugs they exhibited different behavioural and biochemical responses than healthy controls; however, behavioural and biochemical responses also varied considerably among problem gamblers. Dopamine has been implicated as being an important neurotransmitter in the brain's pleasure and reward system, and has been the most heavily researched neurotransmitter in the substance abuse and addiction literatures (Nestler, 2004). Dopamine has not been extensively studied in problem gamblers; however, it has been hypothesized as being associated with the development and maintenance of problem gambling behaviours that are experienced as rewarding or pleasurable by the individual. Studies examining the role of dopamine in problem gambling have also found mixed results (Bergh, Eklund, Sodersten, & Nordin, 1997; Nordin & Eklundh, 1999). More research is needed examining the roles that specific neurotransmitters play in problem gambling behaviours.

Brain imaging research has also found differences between problem gamblers and non-problem gamblers. For instance, using functional Magnetic Resonance Imaging (fMRI), problem gamblers were found to have decreased ventral striatal neuronal activity while gambling when compared to non-problem gamblers (Reuter et al., 2005). This area of the brain has also been found to be associated with decreased activity among problem gamblers during cravings or urges to gamble (Potenza, 2008).

Other studies have found evidence of a possible genetic component to problem gambling. Black, Monahan, Temkit, and Shaw (2006) found that lifetime rates of problem gambling were significantly higher among relatives who had a gambling problem than among control relatives. Furthermore, examining data from 3,359 twin pair members of the Vietnam Era Registry, Eisen

et al. (2001) found that inherited factors explained a substantial proportion of problem gambling symptom variance.

Correlates of Problem Gambling

A review of the literature shows that being male, being of young age, being unemployed, being on welfare, being a university or college student with low academic achievement, living in a large city, and being an immigrant or belonging to a minority ethnic group are risk factors for problem gambling (Johansson, Grant, Kim, Odlaug, & Gotestam, 2009). However, research suggests that demographic and social variables may differ between male and female problem gamblers. Afifi, Cox, Martens, Sareen, and Enns (2010) found that female problem gamblers were more likely to be middle aged, have lower levels of income, lower levels of education, and to report higher levels of stress. In contrast, male problem gamblers were more likely to be separated, widowed, or divorced and more likely to report low levels of social support. Males who develop gambling problems have also been found to begin gambling at an earlier age than females, while females begin gambling at a later age but develop gambling problems faster than males (Grant & Kim, 2002; Ladd & Petry, 2002). These problem gambling sex differences suggest that different factors may be involved in the development and maintenance of problem gambling behaviours for males and females.

Psychological Comorbidity and Problem Gambling

There is extensive research showing that problem gambling is often co-occurring with other psychological disorders. Compared to groups from the general population, problem gamblers have been found to have higher prevalence rates of substance use disorders (Rush, Bassani, Urbanoski, & Castel, 2008), major depressive disorder, bipolar disorder (Kennedy et al., 2010), schizophrenia, schizoaffective disorder (Desai & Potenza, 2009), attention deficit

hyperactivity disorder (Breyer et al., 2009), anxiety disorders (Boughton & Falenchuk, 2007), and personality disorders (Sacco, Cunningham-Williams, Ostmann, & Spitznagel, 2008). Research has also shown that increased problem gambling severity is related to the presence of a comorbid psychological disorder (Barry, Stefanovics, Desai, & Potenza, 2011). Many problem gamblers may actually seek treatment for symptoms resulting from a comorbid disorder as opposed to their problem gambling behaviours. Jamieson, Mazmanian, Penney, Black, and Nguyen (2011) found that of 418 individuals seeking addictions treatment with a gambling problem, only 138 reported gambling as their primary issue.

The directionality between problem gambling and other psychological disorders is unknown, but for many, it is likely bidirectional with the symptoms or behaviours of one contributing to the exacerbation of the other. For instance, problem gamblers may engage in gambling to cope with or relieve depressive symptoms; however, loss of money from maladaptive gambling activities may further contribute to their depression. Only a few studies have reported the temporal relationship between the onset of a comorbid psychological disorder and gambling problem. In one study, Kennedy et al. (2010) reported that 71% of outpatients with a comorbid mood disorder and gambling problem had experienced the onset of their mood disorder prior to experiencing problems with gambling.

Although the addiction treatment literature suggests that comorbid psychological disorders have a negative impact on treatment outcome for addiction, few problem gambling treatment outcome studies have reported comorbid disorders and those that have, have typically not reported the relationship between comorbid disorders and problem gambling treatment outcomes (Winters & Kushner, 2003). Findings from most studies that have examined the treatment of problem gambling among clients with a comorbid disorder suggest that these clients

typically do not experience as favourable an outcome and are more likely to drop out of treatment prematurely, when compared to clients presenting only with problem gambling. For instance, problem gamblers were more likely to have negative treatment outcomes and more likely to drop out of treatment if they had a comorbid personality disorder (Pelletier, Ladouceur, & Rheaume, 2008), comorbid anxiety (Echeburua, Fernandez-Montalvo, & Baez-Gallo, 2001; Tolchard & Battersby, 2013), or a comorbid substance use disorder (Echeburua et al., 2001; Milton, Crino, Hunt, & Prosser, 2002; Raylu & Oei, 2007). In contrast, some studies have failed to find differences in treatment dropout rates and outcome between problem gambling clients with a comorbid disorder and those without. Leblond, Ladoucer, and Blaszezyski (2003) found that problem gamblers with comorbid depression, comorbid anxiety, or comorbid substance use were no more likely to drop out of treatment than clients with only a gambling problem. Research has also shown that clients simultaneously receiving treatment for problem gambling and another treatment for a comorbid disorder, have similar treatment outcomes as other problem gambling clients not receiving simultaneous treatment for a comorbid disorder (Champine & Petry, 2010).

Seeking Treatment and Treatment Dropout among Problem Gamblers

Only about 25% of Ontario problem gamblers and 53% of Ontario pathological gamblers ever seek treatment for their gambling problem (Suurvali, Hodgins, Toneatto, & Cunningham, 2008). Suurvali, Cordingley, Hodgins, and Cunningham (2009) conducted a literature review of 19 studies and found that the main reasons for not seeking treatment for problem gambling were wanting to handle the problem on their own, ignorance of treatment or the availability of treatment, perceived stigma associated with problem gambling, feelings of embarrassment or pride, and the belief that their gambling was not a problem and that treatment was unnecessary.

Given these reasons for not wanting to seek treatment, it is not surprising that problem gamblers who had completed suicide were found to have been significantly less likely to have had contact with mental health services in the previous month, 12 months, and in their lifetime than non-problem gamblers who had completed suicide (Seguin et al., 2010). These findings may speak to both the perceived stigma associated with problem gambling, along with the lack of knowledge regarding problem gambling treatment.

A review of the literature also shows that the main factors contributing to seeking help for problem gambling are gambling related harms, including financial problems, relationship issues, and negative emotions directly resulting from maladaptive gambling behaviours (Suurvali, Hodgins, & Cunningham, 2010). These findings suggest that problem gamblers who do seek treatment typically wait until they have experienced multiple negative consequences as a result of their gambling behaviours. Problem gambling severity (more *DSM-IV* criteria met) has also been found to be a significant predictor of seeking treatment for problem gambling (Suurvali et al., 2008).

A high dropout rate among problem gambling clients is also a major issue well documented in the literature. Only 50% to 70% of problem gamblers who begin treatment will actually complete it (Ladouceur, Gosselin, Laberge, & Blaszczynski, 2001; Melville, Casey, & Kavanagh, 2007). The main factors found to predict treatment dropout among problem gambling clients include high levels of impulsivity and sensation seeking traits (Jimenéz-Murcia et al., 2005; Leblond et al., 2003; Smith et al., 2010), poor support networks (Grant, Kim, & Kuskowski, 2004), and a comorbid psychological disorder (Echeburua et al., 2001; Milton et al. 2002; Pelletier et al., 2008; Raylu & Oei, 2007). However, many studies have failed to find

demographic characteristics that predict treatment dropout among problem gamblers (Grant et al., 2004; Jimenéz-Murcia et al., 2010; Leblond et al., 2003).

Problem Gambling Treatments

Over the years, a number of treatments for problem gambling have been utilized. These treatments include: Gambling Anonymous (GA) programs, psychopharmacological treatments, motivational enhancement therapy (MET), and cognitive behavioural therapy (CBT). Gambling Anonymous programs are a more traditional treatment for problem gambling that have not been adequately subjected to empirical testing, yet are still a widely implemented treatment worldwide (Petry, 2009). Psychopharmacological treatments have been implemented and studied as a treatment for problem gambling, although far more research is needed in this area. Motivational enhancement therapy is a brief treatment that has been found to help individuals become motivated to change their problem gambling behaviours. Lastly, CBT is a modern psychological treatment that has been extensively examined and supported as a treatment for problem gambling. The following sub-sections describe each of these treatments in detail.

Gambling Anonymous programs. The most universally used treatment for problem gambling has come from GA programs, which can be accessed all over North America and most of the world. Gambling Anonymous originated in the late 1950s and remains a frequently used treatment for those seeking help for problem gambling. This 12-step program is administered in a support group format and is modeled after Alcoholics Anonymous (AA). Gambling Anonymous programs progress from the first step of admitting one is powerless over his or her gambling behaviours, to the final step of engaging in learned behaviours and trying to communicate such learned behaviours to other compulsive gamblers. The ultimate goal of GA is the achievement of abstinence. However, despite the long history of GA, few controlled studies

have examined the efficacy of these programs. Furthermore, longitudinal and retrospective research on GA suggests that these programs may not be very effective (Brown, 1987; Oei & Gordon, 2008). In a five year longitudinal study conducted by Brown (1987), it was found that 70% of individuals attending GA drop out in fewer than ten sessions. Moreover, Brown found that only 8% of GA attendees obtained a year or more of abstinence. These findings suggest that GA may only be beneficial for a small percentage of individuals suffering from maladaptive gambling behaviours. In contrast, Petry (2003) found that outpatients in a gambling treatment program were more likely to have positive treatment outcomes if they were concurrently attending regular GA meetings. However, because Petry's (2003) findings were only correlational and, in addition, treatment motivation has been found to be a strong predictor of positive treatment outcome among problem gamblers, it is possible that GA attendance may have acted as a proxy measure for treatment motivation (Petry, 2005). Much more research is needed examining GA programs, as well as, the benefits of the combination of GA attendance with psychotherapy treatments for problem gambling.

Psychopharmacological treatments. To date, the Food and Drug Administration has not approved any medication for the treatment of problem or pathological gambling. However, studies have recently begun examining the efficacy of several types of medications for problem gambling. These studies have primarily examined the use of opioid antagonists, antidepressants, and mood stabilizes (Hollander, Sood, Pallanti, Rossi, & Barker, 2005; Petry, 2009). Although early studies suggest that psychopharmacological treatments may have short-term benefits for some problem gamblers (Hollander et al., 2005), many researchers argue that given the high rates of psychiatric co-morbidity (e.g., mood, anxiety, and substance use disorders) within the problem gambling population, it is likely that such medications benefit these individuals simply

because they treat underlying mental health issues (Hollander, Kaplan, & Pallanti, 2004). For instance, Hollander, Pallanti, Allen, Sood, and Rossi (2005) implemented a 10-week double-blind, placebo-controlled study with 40 participants who were suffering from a bipolar spectrum disorder and pathological gambling. Participants were randomly assigned to either lithium carbonate (i.e., mood stabilizer) or a placebo, with those receiving lithium showing significant reductions in pathological gambling symptoms while taking the medication. Such studies suggest that some psychopharmacological treatments may help those suffering from problem gambling, particularly those with a comorbid psychological disorder. Researchers have also argued that more investigation needs to be carried out examining the efficacy of different psychopharmacological treatments on specific subgroups of problem gamblers such as those suffering primarily from impulse control issues and those who gamble mainly to help regulate strong emotions (Lupi et al., 2014). Overall, research supporting the efficacy of psychopharmacological treatments for problem gambling remains largely underdeveloped, especially compared to the extent of research that have been conducted examining these treatments on other psychological disorders (e.g., depression, ADHD). Much more research is needed examining psychopharmacological treatments for problem gambling in general, problem gambling combined with other comorbid disorders, and subgroups of problem gamblers (Grant & Kim, 2006; Hollander et al., 2005; Lupi et al., 2014; Petry, 2009).

Motivational Enhancement Therapy. Motivational enhancement therapy is a brief intervention (i.e., four or fewer sessions) that is implemented to create internal motivation for change within the client, by helping the client identify and resolve any reluctance to change maladaptive behaviours. Conceptually, MET is based on the trans-theoretical model of change, which consists of five observable stages: pre-contemplation, contemplation, preparation, action,

and maintenance (Prochaska & DiClenente, 1984). Motivational enhancement interventions are tailored to specific stages within the change process in order to elicit successful transition from one stage to the next. Sessions are designed to help empower the client and build client self-efficacy; meanwhile, creating motivation within the client to further commit to the change process. Initially developed for individuals suffering from heavy alcohol consumption (Miller & Rollnick, 1992), numerous studies have found MET to be effective for individuals with problem drinking behaviours (e.g., Adamson & Sellman, 2008; LaBrie, Lamb, Pedersen, & Quinlan, 2006; Sellman, Sullivan, Dore, Adamson, & MacEwan, 2001). Motivational enhancement therapy has also been applied to the treatment of other substance-use problems including smoking, marijuana, and heroin use (Miller, 1996).

More recently, studies have begun to examine the efficaciousness of MET as a treatment for problem gambling. Hodgins, Currie, and El-Guebaly (2001) conducted a randomized control trial with 102 adult problem gamblers being randomly assigned to a wait-list control, CBT workbook exercises, or a telephone MET session plus CBT workbook. Those receiving the MET session plus the CBT workbook were found to have the greatest reductions in problem gambling behaviours both immediately following treatment and at three and six-month follow-up. In another study, Carlbring, Jonsson, Josephson, and Forsberg (2010) randomly assigned 150 patients with gambling problems to eight sessions of group CBT, four sessions of group MET, or a no treatment (wait-list) control group. Post treatment, both CBT and MET groups showed significant reductions in most problem gambling behaviours when compared to the no treatment control group. Furthermore, those administered either treatment showed significant within group reductions in problem gambling behaviours at six and 12-month follow-up. However, no differences were found between treatment groups at any follow-up point suggesting CBT and

MET were equally effective. These two studies suggest that MET can be an efficacious treatment for some problem gamblers when administered as an intervention by itself, but also, as an initial phase to further CBT exercises.

Cognitive Behavioural Therapy (CBT). Cognitive behavioural treatments for problem gambling were originally developed because of the success of this method of treatment with individuals suffering from substance use problems. As a result, many of the CBT components implemented in problem gambling treatment (e.g., motivational enhancement, relapse prevention) have been adopted from pre-existing substance addiction models (Tavares, Zilberman, & Guebaly, 2003). The underlying assumptions of CBT for problem gambling are that irrational beliefs and erroneous perceptions of control, high expectations for winning, flawed attributions, and selective memory all contribute to a lack of control over one's gambling behaviours (Joukhador, Maccallum, & Blaszczynski, 2003). The two most prominent cognitive distortions are "primary illusory control" (i.e., the gambler believes he or she is able to control gambling outcomes) and "secondary illusory control" (i.e., the gambler believes he or she is able to predict gambling outcomes), which together establish a basis of problematic and irrational beliefs about gambling behaviours. Cognitive behavioural therapy aims to help the client understand the origins of their gambling problem and why their problem is maintained over time; concurrently, providing cognitive and behavioural strategies to break such maladaptive patterns and reach their goals regarding their gambling behaviours (Ladouceur & Lachance, 2007).

Cognitive behavioural therapy programs for problem gambling typically include motivational enhancement, behavioural and cognitive interventions, and relapse prevention knowledge and strategies. Following Ladouceur and Lachances' (2007) CBT manual for problem gambling, motivational enhancement is carried out at the beginning of treatment to

boost the client's intrinsic motivation to change through exploring and resolving any client ambivalence toward their gambling behaviours. Next, behavioural interventions are implemented to help the client understand high-risk situations (e.g., drinking alcohol) that can lead to excessive gambling and help them develop concrete strategies to avoid such high-risk situations. Along with behavioural interventions, cognitive interventions are implemented to help the client identify and change their erroneous cognitions that may lead to maladaptive gambling behaviours. In particular, emphasis is placed on erroneous cognitions of illusions of control in which individuals trick themselves into believing that they have control over winning when, in reality, the individual can do nothing to increase his or her chance of winning. Lastly, the client is taught that relapse is a normal process and is helped to develop strategies to both prevent relapse and overcome relapse if it occurs. These stages of therapy usually take place over 12 weekly sessions.

A review of the literature shows that individual CBT approaches have been the most extensively supported treatment for problem gambling (e.g., Ladouceur et al., 2001; Sylvain, Ladouceur, & Boisvert, 1997). Although many of these studies have implemented treatments that vary according to the emphasis placed on different CBT components (e.g., motivational enhancement, cognitive strategies, and behavioural strategies) and the order in which these components are implemented, the underlying assumptions and objectives of CBT for problem gambling remain the same across treatments.

Cognitive Behavioural Group Therapy for Problem Gambling

Research has also supported the efficaciousness of CBT for problem gambling administered in a group format (e.g., Dowling, Smith, & Thomas, 2007; Jimenéz-Murcia et al., 2007; Ladouceur et al., 2003). Group therapy has several benefits, such as increased social

support, learning from others' successes and failures, and the ability to utilize group cohesion for therapeutic gains (Coman, 2002; Ladouceur et al., 2003). Moreover, group therapy is more cost and time efficient than individual therapy because therapists are able to treat multiple clients at once (Coman, 2002).

Jimenéz-Murcia et al. (2007) conducted one of the largest studies on group CBT for problem gambling. These authors administered group CBT to 290 outpatient adult clients who met *DSM-IV-TR* criteria for "pathological gambling" but did not meet criteria for a psychotic episode, Axis II personality disorder, and had not exhibited current suicidal behaviours. Treatment consisted of 16 weekly, 90-minute sessions with therapy groups of 10 to 14 clients. Treatment focus included psychoeducation on problem gambling, stimulus control methods (e.g., avoidance of high-risk situations, money control), cognitive restructuring (e.g., illusion of control), social skills training, and relapse prevention strategies. Results showed that 30.3% of clients dropped out of treatment, but that 76.1% of clients who completed treatment achieved abstinence throughout the 16-week treatment period. Furthermore, 81.5% of clients who completed both treatment and six-month follow-up reported abstinence at this time. However, almost 50% of the original treatment group did not attend the six-month follow-up session, and as a result, it is impossible to determine exactly how many total clients were able to achieve abstinence from gambling six months following treatment. These attrition rates at treatment completion and 6 month follow-up are higher than rates reported by other studies examining group CBT for problem gambling, perhaps because these authors did not exclude participants also showing signs of additional mental illnesses such as depression and bipolar disorder (e.g., Ladouceur et al., 2003). Additionally, these authors administered 16 sessions of group CBT as opposed to shorter treatments composed of seven or ten sessions (e.g., Ladouceur et al., 2003;

Myrseth, Litlerè, Støylen, & Pallesen, 2009). Finally, these authors reported clients' rates of abstinence, as opposed to clients' rates of moving below the cut-off score of five *DSM-IV-TR* criteria for pathological gambling. Thus, although this study's successful outcome rates may seem smaller than those of other studies (e.g., Ladouceur et al., 2003; Myrseth et al., 2009), this is at least partially due to the stringent criteria for determining client success.

Randomized Controlled Trials on Group Cognitive Behavioural Therapy for Problem Gambling

To date, numerous randomized control trials (RCTs) have been conducted on closed group CBT for the treatment of problem gambling. Across these studies, slight variations of CBT have been administered to the treatment group; however, all have placed significant emphasis on at least three main components: awareness of high-risk situations that can lead to excessive gambling, cognitive correction and maladaptive cognitions about gambling, and relapse prevention. The number of CBT sessions ranges across studies from four (e.g., Petry, Weinstock, Ledgerwood, & Morasco, 2008) to 12 sessions (e.g., Dowling et al., 2007) with the majority ranging between eight to twelve, 60 to 120 minute sessions. Within these studies, post-treatment follow-up periods range from immediate to 24 months, and most of these studies have used the *DSM* criteria for pathological gambling as one of the pre- and post-treatment measures. Finally, the preferred gambling activity of the client (e.g., slot machines, poker, electronic gambling, scratch/lottery tickets, horse racing) and treatment comparison groups (e.g., individual CBT, only motivational interviewing) varies across studies.

Group CBT verses wait-list control groups. Ladouceur et al. (2003) conducted a RCT to examine the efficacy of group CBT for problem gambling. These authors randomly allocated outpatient adult clients with a diagnosis of pathological gambling (according to *DSM-IV-TR*

criteria) who showed no current or past evidence of schizophrenia, bipolar disorder, or organic mental disorder, to either group CBT treatment ($n = 34$) or a wait-list control group ($n = 25$). The treatment group received ten weekly, 120-minute sessions of group CBT. Treatment focus was primarily cognitive correction regarding the concepts of randomness, awareness of erroneous beliefs and inaccurate perceptions held by gamblers (e.g., if I lose five times in a row, I am more likely to win next time), awareness and prevention of high-risk situations likely leading to problem gambling (e.g., entering a casino), and relapse prevention strategies. Results showed that immediately following treatment, 30 of 34 clients (88%) no longer met *DSM-IV-TR* criteria for pathological gambling. In contrast, 20 of 25 participants (80%) who remained on the wait-list for treatment still met *DSM-IV-TR* criteria for pathological gambling after the four-month waiting period. Furthermore, additional pre- and post-treatment measures showed that clients in the treatment group reported significant improvements in their perception of control regarding their gambling problem, as well as in their self-efficacy in high-risk gambling situations; both of which are main objectives in CBT for problem gambling (Ladouceur et al., 2001). Additionally, treatment group follow-up showed that at six-months, 12-months, and 24-months post-treatment, there were no significant changes in pathological gambling *DSM-IV-TR* scores when compared to immediate post-treatment scores. However, these results may be misleading because seven (six-month follow-up), eight (12-month follow-up), and twelve (24-month follow-up) participants from the treatment group did not complete the *DSM-IV-TR* follow-up measures. As a result, it is impossible to determine the precise number of participants who actually remained under the *DSM-IV-TR* cut-off score for pathological gambling at these follow-up periods. It is possible that participants failing to complete follow-up measures may have been more likely to

have relapsed. Nonetheless, these findings provide evidence supporting group CBT as an efficacious problem gambling treatment for some clients for up to two years following treatment.

Group CBT was also supported as an efficacious treatment for problem gambling in a Norwegian study conducted by Myrseth et al. (2009). In this study, all participants ($n = 14$) initially met *DSM-IV-TR* criteria for pathological gambling, and had not been suffering from any additional substance use or psychotic disorder. Participants were randomly assigned to either the treatment group that underwent seven weekly, 90-minute sessions of group CBT or a wait-list control group. Group treatment included educating clients on the gambling industry, the concept of randomness, and the gambler's fallacy and its effect on gambling behaviour. In addition, treatment included motivational interviewing, identifying and managing high-risk situations, and relapse prevention. Although these sessions were adopted from an individual treatment program (Prescott & Skjerve, 2002), the program was tailored for group therapy, as clients were given the opportunity at the beginning of each session to discuss within the group any thoughts or feelings regarding their experiences with trying to refrain from gambling in the past week. Results showed that participants assigned to the CBT treatment group showed a significant reduction in *DSM-IV-TR* pathological gambling criteria compared to the wait-list control group. Among participants in the treatment group six of seven (86%) adult clients endorsed 50 to 100% fewer *DSM-IV-TR* criteria for pathological gambling immediately following the final session of group CBT, while only three of seven wait-list control participants endorsed 50-100% fewer *DSM-IV-TR* criteria for pathological gambling following the seven week waiting period.

In a recent Canadian study, Toneatto, Pillai, and Courtice (2014) found support for a five-session mindfulness-enhanced group CBT for problem gambling with each of the five sessions including a 45 minute CBT component, followed by a 45 minute mindfulness instruction and

practice component. The CBT component of the intervention included traditional content-focused techniques such as behavioural problem-solving and cognitive restructuring. The mindfulness component included instruction in awareness of breathing for present-focused attention and awareness of cognitive processes, especially those pertaining to gambling. Mindfulness meditation is utilized to help problem gamblers learn to cope with cognitions related to gambling, without necessarily trying to change them (Toneatto, Vettese, & Nguyen, 2007). Participants included 18 pathological gamblers who did not meet criteria for a substance use disorder and were not receiving any concurrent problem gambling intervention. Results showed that participants randomly assigned to the treatment group ($n = 9$) reported significantly fewer *DSM* symptoms and lower levels of gambling urges following treatment than did the control group ($n = 9$) following their waiting period. Furthermore, of the participants ($n = 14$) available at three-months post-treatment, 21% met diagnostic criteria for pathological gambling, a significant reduction from the proportion of participants having met criteria at baseline (95%). A limitation of this study is the inability to determine the degrees to which the CBT component of the intervention and the mindfulness component of the intervention contributed to treatment outcome. These authors do report however that participants who reported engaging in mindfulness practice outside of therapy sessions demonstrated significantly better clinical outcomes than those participants who did not report mindfulness practice.

Group CBT verses individual CBT. Dowling et al. (2007) conducted a study in Australia comparing the efficacy of individual CBT to group CBT in the treatment of pathological gambling. Fifty-six outpatient adult females meeting the *DSM-IV-TR* criteria for pathological gambling were randomly allocated to one of three groups: group CBT, individual CBT, or wait-list control. Those allocated to group CBT ($n = 17$) underwent 12 weekly, 120-

minute sessions that ranged from four to six clients per group. Those allocated to individual CBT ($n = 14$) underwent 12 weekly, 90-minute sessions. Content in each treatment group was the same. Sessions consisted of techniques to control cash flow, learning about engaging in alternative activities to combat gambling behaviours, cognitive correction regarding randomness and problematic beliefs and perceptions about gambling, cognitive therapy that focused on more general problematic beliefs and thoughts, problem solving skills training, communication and assertiveness training, and relapse prevention. Furthermore, the final 20 minutes of the first six sessions consisted of client imaginal desensitization. Any specific differences between individual and group therapy administrations (e.g., allowing for group process, strategies to build group cohesion) were not discussed in the article; however, given that group sessions were 30 minutes longer than individual sessions it is possible that group process may have occurred during group CBT administration. Results showed that clients from both individual CBT and group CBT treatment groups were significantly more likely to no longer meet *DSM-IV-TR* criteria for pathological gambling immediately following treatment when compared to the wait-list control. However, individual treatment groups were found to be slightly more efficacious in treating problem gambling behaviours based on gambling measures administered immediately following the conclusion of treatment. Moreover, six-month follow-up measures showed that 92% of clients receiving individual therapy did not meet *DSM-IV-TR* criteria for pathological gambling, while only 60% who participated in group therapy did not meet *DSM-IV-TR* criteria. This suggests that the longer-term efficaciousness of group CBT may not be as strong as individual CBT for the treatment of pathological gambling. However, these results are limited to a female pathological gambling population who gamble primarily on electronic gaming machines and may not be generalizable to other populations. This is a particularly important point to consider

as research has found that the reasons women gamble (e.g., escaping negative affective states and life stresses) are typically different than the reasons why men gamble (e.g., thrill and excitement) (Ladd & Petry, 2002). As a result, some authors have argued that group therapy designed specifically for women suffering from problem gambling should include focus on emotional regulation and coping strategies (Piquette-Tomei, Norman, Dwyer, & McCaslin, 2008).

In a more recent Australian study, Oei, Raylu, and Casey (2010) randomly assigned 102 problem gamblers to group CBT ($n = 42$), individual CBT ($n = 42$), or six week wait-list control ($n = 28$). Treatments consisted of a manualized CBT program for problem gamblers that included combined motivational interviewing and cognitive behavioural components (Raylu & Oei, 2010). Participants allocated to individual CBT received six weekly sessions each lasting 120 minutes, while participants allocated to group CBT received six weekly sessions each lasting 150 minutes. Pre-treatment, post-treatment, and six month follow-up measures included items measuring variables related to problem gambling (e.g., gambling cognitions, gambling urges, negative psychological states) and items assessing frequency of gambling and amounts of money gambled. Results showed that at post-treatment both treatment groups demonstrated significant improvements on all dependent variables, while the wait-list control group failed to show any significant improvements. Furthermore, six-month follow-ups showed that the majority of therapeutic gains for both treatment groups had been maintained. Comparisons between treatment groups showed that there were few significant differences in therapeutic gains as most pre- and post-treatment effect sizes for group CBT ranged from .24 to .73 and all effect sizes for individual CBT ranged from .16 to .73. Participant attrition rates were slightly higher for group CBT ($n = 13$) than individual CBT ($n = 7$).

Group CBT verses GA programs. Very few RCTs have been conducted examining the efficaciousness of GA programs and none have been conducted that compare the efficaciousness of GA programs with group CBT. However, Toneatto and Dragonetti (2008) conducted a study in Canada that implemented a quasi-experimental design comparing group CBT to a GA program. Participants were recruited to take part in the study if they had a self-defined gambling problem, were interested in outpatient treatment, and did not show evidence of severe mental illness. The two treatments took place in different geographical locations, and as a result, participants were not able to be randomly assigned to treatment conditions. Participants either took part in eight weekly sessions of group CBT ($n = 65$) or eight weekly sessions of a brief GA program ($n = 61$). The CBT treatment consisted of problem solving, stimulus control, and cognitive restructuring of gambling-related problematic beliefs. The brief GA program consisted of progression through the first five steps of GA: (1) to admit that one is powerless over their gambling, (2) come to believe in a power greater than oneself that can restore one to normal thinking and living, (3) decide to turn oneself over to this greater power, (4) search fearlessly for a moral and financial inventory of oneself, and (5) admitting to oneself and others the exact nature of one's wrongs. Results showed that at 12-month follow-up there were no significant differences in effectiveness between treatment groups. However, these results may be misleading. Although the two groups were highly comparable on demographic variables and most gambling-related variables at baseline, baseline comparisons between groups did reveal that 96% of participants in the GA group reported a treatment goal of abstinence, while only 35% in group CBT had reported this goal. This baseline group difference may have biased the results as participants with a goal of abstinence attended more sessions throughout treatment and attained higher abstinence rates at both end-of-treatment and at 12-month follow-up. This suggests that

the GA group may have been composed of participants more dedicated to changing their maladaptive gambling behaviours, and thus, may have achieved better results regardless of the treatment they were administered.

In a study conducted in the United States, Grant et al. (2009) randomly assigned 68 pathological gamblers to either imaginal desensitization plus motivational interviewing (IDMI) ($n = 33$) or GA participation ($n = 35$). Imaginal desensitization is a specific cognitive behavioural relaxation-based technique used in the treatment of maladaptive impulse-driven behaviours such as problem gambling (McConaghy, Blaszczynski, & Frankova, 1991). Participants administered IDMI received six weekly, one hour sessions of group therapy that included psychoeducation, motivational enhancement, behavioural strategies, cognitive strategies to help cope with gambling urges and irrational thoughts, imaginal desensitization, relapse prevention, and assertiveness training. Participants assigned to GA programs were given a list of 75 different GA meetings and were told to attend sessions convenient for them over the following eight weeks. Post-treatment assessments showed that participants assigned to the IDMI group were significantly more likely to have reached a full month of abstinence from gambling during treatment (63.3%) than participants assigned to GA (17.1%). Furthermore, IDMI participants showed significant improvements on post-treatment measures assessing gambling severity, depression, anxiety, and psychosocial functioning when compared to GA participants. Finally, those initially assigned to eight weeks of GA, later showed a significant reduction in gambling symptoms following six sessions of IDMI. Although this study suggests that cognitive behavioural approaches may be more efficacious than GA for treating problem gambling, more controlled studies need to be conducted comparing the efficaciousness of cognitive behavioural treatments with GA programs.

Group CBT verses only Motivational Interviewing. Carlbring et al. (2010) conducted a study in Sweden examining the efficaciousness of two treatments for pathological gambling. Outpatient clients meeting *DSM-IV-TR* criteria for pathological gambling were randomly assigned to one of three groups: group CBT (*n* = 68), motivational interviewing (MI) (*n* = 59), or a wait-list control (*n* = 46). Baseline assessment showed that there were no significant differences among groups on any measures or demographic variables. Group CBT consisted of eight weekly, three-hour sessions with a mean number of clients in each group of approximately three. Group CBT focused on psychoeducation, cognitive restructuring, identifying alternative activities to gambling, imaginary exposure, identification of high-risk behaviours, and relapse prevention. Meanwhile, MI consisted of four biweekly, 50-minute sessions. The MI sessions were administered one-on-one with clients and focused on exploring the positive and negative consequences of gambling, while mapping out reasons for continuing and stopping gambling. Results showed that immediately following treatment, both treatment groups scored significantly lower on measures of maladaptive gambling behaviours when compared to the wait-list control group. Moreover, there were no significant differences found on outcome measures between treatment groups immediately following treatment, at 6-month follow-up, or at 12-month follow-up. These results suggest that group CBT and MI are equally efficacious in treating pathological gambling. However, attrition rates were relatively high in the CBT group (71.2% over the course of treatment), when compared to the MI group (52.4% over the course of treatment), and relative to other studies examining group CBT for problem gambling (e.g., Dowling et al., 2007). This may be, in part, due to the three-hour length of each group CBT session. Group CBT for problem gambling has typically implemented sessions that are 90 to 120 minutes in length (e.g., Ladouceur et al., 2003). Three-hour sessions may have been viewed as too long for many clients

and, as a result, attrition rates may have steadily grown over the course of treatment. Carlbring et al.'s (2010) study suggests that both group CBT and MI are equally efficacious treatments for pathological gambling, but this is a difficult conclusion to reach given the poor attrition rates, particularly within the CBT group.

Internet Gambling

Over the past 20 years, gambling opportunities have grown substantially and a major reason for this growth has been the recent development of the Internet gambling industry. Internet, or online gambling, is "all forms of gambling on chance events for money (including wagering and betting on skilled games) via the Internet. This includes gambling using computers, mobile phones, or wireless devices connected to the Internet" (Gainsbury, Russell, Hing, Wood, & Blaszczynski, 2013, p. 2). Currently, there are over 2000 gambling sites available via the Internet, estimated to reach a global yearly profit of 49 billion US dollars by 2017 (Marketline, 2013). Internet gambling has made gambling opportunities accessible worldwide to anyone with an Internet connection and a means of transferring money electronically (Wood & Williams, 2009). Gambling websites provide easy, 24 hour access seven days a week to numerous casino games including poker rooms, blackjack, craps, baccarats, slot machines, horse racing, sports betting, lotteries, and bingos (Casino City, 2013). Internet gambling also allows individuals to gamble anonymously and privately, from the comfort of their own homes (Wood & Williams, 2009). Most gambling websites are user-friendly, providing tutorials on how to play the full range of games provided, along with demo or practice opportunities to become familiar with the games before playing them for real money.

Despite various consumer benefits, researchers have identified several concerns about online gambling. For instance, (1) credit card access allows Internet gamblers to gamble

themselves into excessive debt; (2) unlike land-based casinos, Internet casinos cannot monitor the alcohol or drug consumption of their patrons, and as a result, are unable to stop intoxicated patrons from gambling further (Griffiths, 2001); (3) demo gambling sites may encourage Internet gambling as many of these sites have been found to provide inflated payout rates, leaving the patron with an unrealistic view of payouts in real Internet gambling (Sevigny, Cloutier, Pelletier, & Ladouceur, 2005); (4) Internet gambling characteristics, such as the opportunity to play multiple games at once, allows consumers to wager money at faster rates (Gainsbury, Parke, & Suhonen, 2013), (5) there are few safeguards preventing under-age youth from gambling on the Internet (Wood & Williams, 2007); and (6) issues with consumer mistrust such as website legitimacy, security and payout fairness (Gainsbury et al., 2013; Harris, Mazmanian, & Jamieson, 2013). Given these and other concerns regarding Internet gambling, the importance of research on this topic is evident. However, Internet gambling is a new and rapidly evolving movement, and as a result, research in this area remains relatively underdeveloped.

Internet gambling participation and problem gambling. Research to date suggests a strong relationship between Internet gambling participation and problem gambling behaviours (e.g., Gainsbury et al., 2013; Griffiths & Barns, 2008; Griffiths, Wardle, Orford, Sproston, & Erens, 2009; Wood & Williams, 2011). For instance, utilizing the CPGI in a survey of 12,521 international gamblers, Wood and Williams (2011) found that the prevalence of problem gambling was three to four times higher among Internet gamblers (16.4%) than non-Internet (exclusively land-based) gamblers (5.7%). Among the Canadian Internet gamblers within this sample ($n = 179$), Wood and Williams found that 17.1% of Internet gamblers met criteria for problem gambling and 37.9% met criteria for at-risk problem gambling, while 4.1% and 7.7% of non-Internet gamblers met criteria for problem gambling and at-risk problem gambling

respectively. Furthermore, other differences were noted between Internet and non-Internet gambling groups. For example, Internet gamblers most often reported poker (31.3%), slot machines (12.5%), VLTs (12.5%), and roulette (12.5%) as being the online games that have contributed most to their gambling problems. In contrast, non-Internet gamblers reported slot machines (31.8%), video lottery terminals (17%), poker (10.2%), and bingo (8%) as the games that have contributed most to their gambling problems. Despite the growing number of studies demonstrating a relationship between Internet gambling and problem gambling, due to methodological limitations within these studies (e.g., cross-sectional design), the direction of causality of this relationship is unknown (Wood, Williams, & Park, 2012). In other words, it may be the case that problem gamblers are more likely to seek out more gambling opportunities including those via the Internet. Research has found that problem gamblers are more likely to regularly participate in two or more gambling activities (McCormack, Shorter, & Griffiths, 2013). In fact, the vast majority of problem Internet gamblers also report utilizing land-based gambling venues (Gainsbury, Wood, Russell, Hing, & Blaszczynski, 2012; Wardle, Moody, Griffiths, Orford, & Volberg, 2011). It may also be the case that the characteristics of Internet gambling may contribute to the engagement in problem gambling behaviours. In a qualitative study examining the features of Internet gambling that contribute to a loss of control in gambling behaviours, easy accessibility, ease of gambling on credit, and excessive online promotions were reported by problem gambling participants as contributors to loss of control (Hing et al., 2014). Regardless of the directionality of this relationship, it is cause for concern, as the Internet has become a means for many to engage in maladaptive gambling behaviours that can result in significant negative consequences for them and their families.

Despite the growing concern of Internet problem gambling, much like land-based problem gamblers, it appears that the majority of problem Internet gamblers never actually seek treatment. Wood and Williams (2011) found that only 9.4% of problem Internet gamblers reported ever seeking help for their problem gambling, most of which reported seeking help from counseling services. Furthermore, 70.2% of problem Internet gamblers in their study reported that they would be more comfortable seeking help from face-to-face counseling rather than Internet counseling. However, research has yet examined the efficacy of face-to-face treatment for Internet problem gamblers.

Present Study

The recent worldwide expansion of Interent gambling has occurred rapidly; consequently, scientific literature examining this topic remains underdeveloped. Research to date suggests that individuals who gamble over the Internet are at an increased risk of engaging in problem gambling behaviours (e.g., Griffiths & Barns, 2008; Wood & Williams, 2011). These findings speak to the need for research examining the efficacy of treatments for problem gamblers who utilize the Internet as a means of access to gambling. Despite research showing that there are efficacious treatments for many individuals suffering from problem gambling (e.g., Ladouceur et al., 2003); to the current author's knowledge, there are no published studies to date that have examined the efficaciousness of treatment on problem gamblers who utilize the Internet as a means of access to gambling.

The primary purpose of this study was to examine the efficacy of group CBT for self-identified problem Internet gamblers. Cognitive-behavioural therapy was utilized in the current study because it has been the most extensively studied and supported treatment in the problem gambling literature. Furthermore, treatment was administered in a group format because group

therapy is more cost and time efficient than individual therapy, due to therapists being able to treat multiple clients at once (Coman, 2002). First, it is hypothesized that the treatment group will show a significant pre- to post-test reduction in endorsed *DSM-IV* criteria for pathological gambling,[1] urge to gamble, and number of gambling sessions, and a significant increase in perception of control over their gambling behaviours (these outcome variables will be discussed in the methods section), while the control group will not show significant pre- to post-test changes in these outcome variables. Second, it is hypothesized that the treatment group will show significantly more clinically significant change, as measured by predetermined endstate functioning criterion (Hollon & Flick, 1988; Ladouceur et al., 2003) on three outcome measures: *DSM-IV* criteria for pathological gambling, perception of control over gambling, and urge to gamble. Third, in combining both the treatment group and the control group following their treatment, it is hypothesized that all participants having undergone treatment will show significant pre- to post-treatment and pre- to three-month post-treatment improvements on all four outcome measures: *DSM-IV* criteria for pathological gambling, urge to gamble, number of gambling sessions, and perception of control over gambling behaviours. It is important to note that the current study did not focus on treatment outcomes as they related specifically to Internet gambling (i.e., the reduction in only Internet problem gambling behaviours), but instead on treatment outcomes related to problem gambling in general (i.e., both problem gambling behaviours on the Internet and at land-based venues). Although the current study is unique in that it examines treatment efficacy for problem Internet gamblers, most problem Internet gamblers also engage in problem gambling behaviours at land-based venues (Wardle et al., 2011). As a result, it is important to measure problem gambling behaviours in general, as positive treatment

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[1]   *DSM-V* was not available at the date of this study.

outcomes would ideally be associated with improvements in both Internet and non-Internet problem gambling behaviours.

The secondary purpose of the present study was to qualitatively examine participants' perspectives on their treatment experiences, especially in relation to the treatment outcome decreasing their Internet problem gambling behaviour. Although the majority of problem Internet gamblers also gamble to varying extents at land-based venues, it is important to better understand how the Internet may contribute to problem gambling and impede the process of treating and overcoming problem gambling behaviours (Wardle et al., 2011). The Internet provides unlimited access to gambling, access to gambling from any location with an Internet connection, access to gambling using credit, and an easier means of hiding gambling behaviours from others. Researchers have argued that such factors may make gambling over the Internet more addictive and problematic (Gainsbury et al., 2013; Griffiths & Barns, 2008). As a result, the argument could be made that problem Internet gambling behaviours may be less responsive to current evidence-based problem gambling treatments. Following treatment, participants in the current study were asked a series of open-ended questions to explore aspects or specific components of treatment that they may, or may not have, found to be useful for decreasing their Internet problem gambling behaviour. Self-perceived obstacles or challenges, specific to reducing problem Internet gambling behaviours, were also examined. Due to the exploratory nature of this analysis no formal hypotheses were identified prior to data collection and analysis.

Method

Participants

Participants were recruited from the general community through land-based advertisements (see Appendix A), online advertisements (e.g., websites), and local media announcements (e.g., newspaper, radio). To be included in the study participants had to meet the

following criteria: (1) have a self-defined problem with gambling and be interested in participating in treatment for problem gambling, (2) have gambled over the Internet in the past 12 months, (3) not already be receiving treatment for problem gambling, and (4) be 19 years of age or older. Of the 37 gamblers who engaged in the informed consent and intake process, five refused participation in the study, resulting in 32 participants being randomly assigned to either the treatment or control group.

Participants consisted of 17 males and 15 females and ranged from 22 to 52 years of age (*M* age = 34.25 years, *SD* = 7.3). Of the sample, 50% reported being married or in a common-law relationship, 37.5% unmarried, and 12.5% reported having been previously separated or divorced. Forty-four percent of participants reported being employed full-time, 30.3% part-time, and 25% not currently employed, while 25% also reported being enrolled at a university or college. In terms of ethnicity endorsed, 71.9% reported being Caucasian/white, 18.8% Aboriginal (First Nation or Inuit), 6.3% Hispanic/Latino, and 3.1% African-Canadian/Black. The most frequently reported land-based gambling games played by the participants were slot machines (68.8%), casino table games (e.g., blackjack, roulette) (46.9%), bingo (18.8%), and sports betting (12.5%). Internet gambling games most frequently endorsed included poker (56.25%), slot machines (43.75%), sports betting (40.6%), and casino table games (34.4%). Participants entered the study from January 2012 to June 2014.

Measures

Demographic questionnaire. Individual characteristics including age, sex, ethnicity, marital status, employment status, and student status were assessed (see Appendix B).

Gambling Behaviour and Treatment Participation Questionnaire. This brief 6-item gambling behaviour and treatment participation questionnaire was developed by the current

researcher to assess the level of participant involvement in Internet gambling and non-Internet

gambling activities over the past 12 months. These questions were designed to measure the types

of non-Internet gambling and Internet gambling activities they typically engage in. Two items

assess whether or not problem gambling treatment has been engaged in before and the final item

examines participant treatment outcome goals (e.g., stop gambling completely, learn to control

gambling, cut back on gambling) (see Appendix C).

DSM-IV-TR **Based Questionnaire (DBQ)** (Beaudoin & Cox, 1999). The DBQ is a

DSM-IV-TR based self-report questionnaire assessing gambling behaviours and associated

features characteristic of pathological gambling. This measure contains 32-items and is broken

down into two sections. The first section contains 10 items and each is rated on a 4-point scale

where 0 = never; 1 = yes, at some time in my life; 2 = yes, in the past year; and 3 = yes, in the

past month. These items consist of the *DSM-IV-TR* criteria for pathological gambling and have

been widely used in problem gambling research (Cox, Enns, & Michaud, 2004; Volberg, 1999).

The second section contains 22 yes-no items. This section assesses several characteristics

associated with problem gambling. Several of the items in section two have been dropped due to

content overlap with other measures (see Appendix D). In addition, the 10 items within the DBQ

used to assess the *DSM-IV-TR* pathological gambling criteria were administered two additional

times with slightly modified instructions. These 10 items were administered with specific

instructions to answer the items as they relate to only non-Internet gambling behaviours (see

Appendix E) and again to only Internet gambling behaviours (see Appendix F).

DSM-IV-TR **criteria for Pathological Gambling** (American Psychiatric Association,

1994). The 10 criteria for pathological gambling were administered in a questionnaire format.

Criteria were assessed based on the previous 4-week time period. This questionnaire was

administered in three formats: (1) specific instructions to answer criteria as they relate to all gambling behaviours (see Appendix G), (2) specific instructions to answer criteria as they relate to only non-Internet gambling behaviours (see Appendix H), (3) specific instructions to answer criteria as they relate to only Internet gambling behaviours (see Appendix I).

Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De la Fuente, & Grant, 1993). The AUDIT is a 10-item self-report questionnaire that measures past year alcohol consumption, drinking behaviour, and alcohol related problems. Total scores range from 0 to 40, with a score of eight or more indicating hazardous or harmful alcohol use. The AUDIT has been shown to have good internal consistency and strong validity (Allen, Litten, Fertig, & Barbor, 1997) (see Appendix J).

Gambling Related Questions (Ladouceur & Lachance, 2007). This five-item questionnaire is recommended by Ladouceur and Lachance (2007) as a pre- and post-treatment assessment measure for clients of a CBT program for problem gambling. This brief questionnaire measures perception of control over gambling (i.e., 0% to 100%), desire to gamble (i.e., 0 to 10), gambling frequency, and money wagered gambling. This measure has been used as a pre- and post-treatment measure in other studies examining the efficacy of individual and group CBT for pathological gambling (Ladouceur et al., 2003; Ladouceur et al., 2001; Sylvain et al., 1997) (see Appendix K).

The Symptom Checklist -90- Revised (SCL-90-R; Derogatis & Unger, 2010). The SCL-90-R is a screening measure for general psychiatric symptomatology and includes dimensions measuring somatization, obsessive-compulsive, depression, anxiety, phobic anxiety, hostility, interpersonal sensitivity, paranoid ideation, and psychoticism. This self-report questionnaire includes 90 items that are measured on a 5-point scale ranging from 0 (not at all) to

4 (extremely). Summing the scores from all 90 items and dividing by 90 computes the Global

Severity Index (GSI) (see Appendix L).

Desirability Scale of the Personality Research Form (Jackson, 1987). This Desirability

scale has 16 items and a high score indicates that the respondent, either consciously or

unconsciously, is responding to the items in such a way that is making him or herself appear

desirable. The Desirability scale has been shown to have good test-retest reliability ($r = .86$) and

internal consistency ($\alpha = .82$). The PRF Desirability Scale has been used in numerous studies in

personality as a detector of mild to extreme participant distortion or faking (see Appendix M).

Infrequency Scale of the Personality Research Form (Jackson, 1987). This Infrequency

scale has 16 items and a high score indicates that the respondent may be randomly or carelessly

responding to the questionnaire items. Test-retest reliability ($r = .46$) and internal consistency (α

$= .51$) are adequate given the nature of this scale. The Infrequency items were scattered

throughout the questionnaire booklet to detect careless or non-purposeful responding (see

Appendix N).

Treatment Completion Qualitative Items. This questionnaire contains four open-ended

questions asking participants what components of the treatment were helpful and what

components of the treatment were not helpful (see Appendix O).

Experimental Design and Procedure

Ethics approval for this study was obtained from the Lakehead University Research

Ethics Board. Participants were recruited from the general community through land-based

advertisements, online advertisements, and local media announcements (e.g., newspaper, radio).

Interested individuals initially contacted the researcher via e-mail or the Health, Hormones, and

Behaviour laboratory telephone number that were provided on advertisements and

announcements. Potential participants initially came into the Health, Hormones, and Behaviour laboratory to complete the screening phase of the study. During this session, they were provided with information about the study, a consent form (see Appendix P), and screening measures to complete. At this time participants were informed that if they consented to participate in the study they were able to withdraw their consent at any time and that complete confidentiality would be maintained. Furthermore, potential participants were informed that if they met inclusion criteria for the study, they would either (1) receive treatment immediately or (2) receive treatment in 12 weeks following the preliminary screening. All online consent forms and questionnaires administered throughout the study were completed using SurveyMonkey (http://www.surveymonkey.com), which is a safe and secure website that many Lakehead University researchers have utilized. Following the initial screening phase of the study, those participants meeting inclusion criteria were invited to take part in the study, while participants not meeting inclusion criteria were given contact information for alternative treatments for problem gambling and other mental health issues. Participants meeting inclusion criteria were then randomly assigned to either (1) problem gambling treatment or (2) a wait-list control. Participants were sequentially randomly assigned by the order in which they underwent the preliminary screening (i.e., first participant was assigned to the treatment group, second to the wait-list control group, third to the treatment group, and so on).

Treatment group. Participants assigned to the treatment group first completed the pre-test measures. These participants were administered 12 weekly group sessions, each lasting 90 minutes in length, and groups were comprised of 3 to 5 participants ($M = 4$, $SD = 1$). Immediately following the treatment period (i.e., 12 weeks), the treatment group was administered post-test measures. Participants were also administered follow-up measures at

three-months post-treatment (see Figure 1a). At the three-month follow-up time, participants

were sent an e-mail reminding them to complete the follow-up questionnaire. The e-mail

included a link to the online questionnaire. Participants were compensated with a $20 gift

certificate to Tim Horton's for completing the post-treatment and three-month follow-up

questionnaire packages.

Wait-list control group. Participants assigned to the wait-list control group first

completed the pre-test measures and were then notified that they would be receiving treatment in

12 weeks time. Wait-list control participants did not undergo any treatment for their gambling

problem during the waiting period. Following the 12-week waiting period participants completed

the post-test measures and were offered the problem gambling treatment. Wait-list control

participants also completed post-treatment measures following their treatment and three-month

post-treatment follow-up measures (see Figure 1b). Participants were compensated with a $20

gift certificate to Tim Horton's for completing the post-treatment and three-month follow-up

questionnaire packages.

Treatment. The treatment program followed Ladouceur and Lachances' (2007)

treatment manual for pathological gambling (Table 1). This CBT program includes four main

components: motivational interviewing, behavioural interventions, cognitive interventions, and

relapse prevention. Treatment consisted of an initial individual session and 11 weekly group

sessions, each about 90 minutes in length. In addition, in accordance with the manual, brief

homework exercises were assigned following each session. Although these sessions were

adopted from an individual treatment program (Ladouceur & Lachances, 2007), the program was

tailored for group therapy, as clients were given opportunities during each session to discuss

within the group their thoughts and feelings regarding their previous experiences with trying to

Figure 1a

Treatment group Procedure

Pre-treatment Measures	Post-treatment Measures	3 Month Measures

CBT Treatment

0   4   8   12   16   20   24   28   32   36
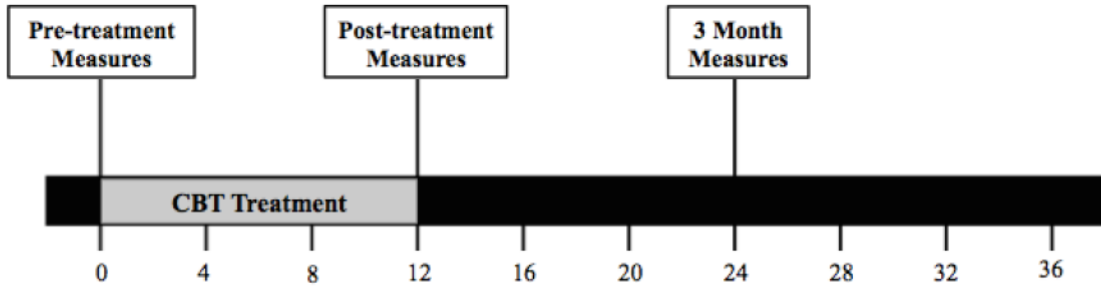
Figure 1b

Wait-list Control group Procedure

Pre-test Measures	Post-test Measures	Post Treatment	3 Month Measures

CBT Treatment

0   4   8   12   16   20   24   28   32   36
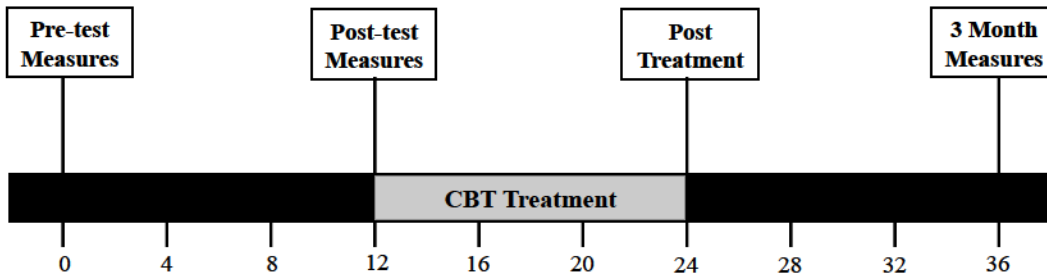
Table 1

Treatment Program (Ladouceur & Lachances, 2007)

Session	Objectives
Motivational Enhancement	
1	• Clarify treatment goals • Enhance motivation to change by exploring and resolving ambivalence
Behavioral Interventions	
2-3	• Help client understand the chain of events that leads to excessive gambling and the importance of high-risk situations in this chain • Increase client's awareness of high-risk situations • Help client identify concrete strategies that can be used to avoid high-risk situations • Teach client the five steps to effective problem solving
Cognitive Interventions	
4	• Identify erroneous thoughts that the gambler entertained before, during, and after a recent gambling session
5-7	• Define concept of chance • Establish difference between games of chance and games of skill • Help client become aware of his or her inner dialogue regarding gambling, and explore the influence of this inner dialogue on the client's decision to gamble • Review a range of gambling traps, and assist the client in recognizing erroneous cognitions
8-10	• Help client recognize erroneous cognitions that affect his or her gambling • Develop skills for challenging and casting doubt on the erroneous thoughts that lead to excessive gambling • Help client appreciate that he or she has the power to decide to gamble or not
Relapse prevention	
11-12	• Help client to understand relapse prevention as a normal process • Orient the client to the possibility of a slip or relapse • Develop strategies that will help prevent slips or a relapse • Establish what to do in case of a slip or relapse • Discuss emergency measures to take in case of slip or relapse

refrain from gambling over the course of the previous week. Such discussion usually occurred during the beginning of sessions right before or after homework for the previous week was discussed.

Therapist. The therapist was a PhD student in clinical psychology practicing under the supervision of a registered clinical psychologist. This student has taken several advanced courses in psychotherapy including courses in CBT and group therapy. In addition, the student has engaged in a supervised clinical placement consisting of cognitive behavioural group therapy with individuals suffering from maladaptive substance use.

Attrition. Thirty-two participants were randomly assigned to either the treatment ($n = 16$) or control group ($n = 16$). Following randomization three participants dropped out of the study, one participant from the treatment group and two participants from the control group. Furthermore, five participants assigned to the control group declined to participate in treatment following the waiting list period. Due to the nature and convenience of data collection (i.e., short questionnaire completed on the Internet via e-mail) many participants continued to complete post-treatment and three-month follow-up measures despite not attending all treatment sessions or discontinuing treatment while in the treatment phase of the study. See Figure 2 for participant attrition at each stage of the study.

Of the 24 participants who began treatment the mean number of sessions attended by participants was seven sessions ($SD = 2.81$) and the number of sessions attended by participants varied considerably: two sessions ($n = 2$, 6.3%), three sessions ($n = 2$, 6.3%), four sessions ($n = 0$), five sessions, ($n = 3$, 9.4%), six sessions ($n = 4$, 12.5%), seven sessions ($n = 1$, 3.1%), eight sessions ($n = 4$, 12.5%), nine sessions ($n = 3$, 9.4%), ten sessions ($n = 3$, 9.4%), 11 sessions ($n = 1$, 3.1%), and 12 sessions ($n = 1$, 3.1%). Participants reported a number of reasons for not

Figure 2

Participant Attrition through the Stages of the Study
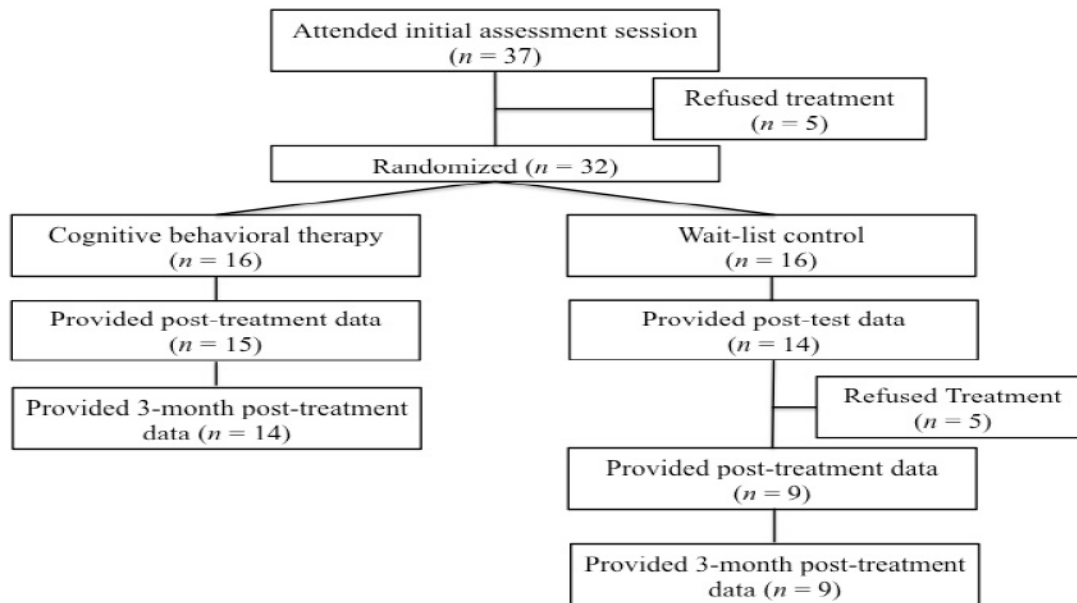
attending treatment sessions including scheduling issues with other commitments, being ill on the day of the session, and low motivation to attend.

Screening phase measures. Potential participants interested in taking part in the study first underwent an initial screening session to determine if they met inclusion criteria for the study. The measures that were administered during the screening phase included the demographic questionnaire, the Gambling behaviour and Gambling treatment questionnaire, the three versions of the DBQ (i.e., gambling in general, specifically non-Internet gambling, and specifically Internet gambling), the AUDIT, and the SCL-90-R.

Pre-test, post-test, and three-month follow-up measures. At pre-test, post-test, and three-month follow-up times, participants completed the general version of the *DSM-IV-TR* criteria for Pathological Gambling and the Gambling Related Questions questionnaire. In addition, participants completed the treatment completion qualitative items at the post-treatment time.

Dependent variables.

(1) ***Problem gambling severity*** is the main dependent variable and was measured by the number of *DSM-IV-TR* criteria met for pathological gambling (see Appendix G). For the *DSM-IV-TR,* scores range from zero to ten with a score of five or more indicating pathological gambling.

(2) ***Perception of control over gambling*** measured on a 0 to 100 scale where 0 = Not at all resolved and 100 = Totally resolved (see Appendix K).

(3) ***Urge to participate in gambling activities*** measured on a 0 to 10 scale where 0 = Not at all and 10 = Totally (see Appendix J).

(4) Frequency of gambling measured by number of gambling sessions (see Appendix

K).

Quantitative data analysis. A series of quantitative statistical analyses were utilized to

examine the treatment program on four gambling related outcome measures: number of *DSM-IV*

pathological gambling criteria endorsed, perception of control over gambling, desire to

participate in gambling activities, and number of gambling sessions. First, as outlined by

Tabachnick and Fidell (2007), data were screened for statistical outliers and incomplete

responses by calculating and examining descriptive statistics. Furthermore, to help ensure that

parametric tests were appropriate for the current sample, Kolmogorov-Smirnov normality tests

were conducted on each of the main continuous variables in the study. Second, a series of pre-

treatment independent sample *t*-tests and chi-square tests were conducted to examine if there

were any significant demographic differences (e.g., sex, age) between the two randomly

allocated groups (i.e., treatment and control groups). Furthermore, independent sample *t*-tests

were utilized to ensure that the two groups did not significantly differ on any of the four outcome

measures at the beginning of the study. Third, immediate post-treatment effects were examined

by implementing a one-way MANOVA followed by univariate post hoc analyses to determine

significant group differences on the four outcome measures at post-test. Fourth, post-

treatment/post-waiting list group differences on clinically significant change were examined

utilizing endstate functioning criterion (Hollon & Flick, 1988) for three outcome measures:

DSM-IV pathological gambling criteria, perception of control over gambling, and desire to

participate in gambling activities. In accordance with Ladouceur et al. (2003) the endstate

functioning criterion scores utilized for these three outcome measures were as followed: less than

five *DSM-IV* criteria for pathological gambling, a score of seven or more for perception of

control over gambling, and a score of three or less for desire to gamble. Fisher's Exact tests were

utilized for these analyses. Fifth, a series of one-way repeated measures ANOVAs were used to

examine the effect of time (pre-treatment, post-treatment, and three-month post-treatment) on the

four outcome measures. For these analyses the two groups were combined and the post-waiting

list data collected from the control group was utilized as their pre-treatment data. A priori tests

using a Bonferroni correction were utilized for ANOVAs found to have a significant difference

across time periods. Finally, to examine factors associated with treatment outcomes, a pre- to

post-treatment change score was calculated for each of the four outcome measures. A series of

two-tailed Pearson product-moment correlation coefficients and two-tailed independent sample *t*-

tests were conducted to examine the relationships between pre- to post-treatment change scores

and participant demographics, pre-treatment measure scores, and number of treatment sessions

attended.

      Qualitative data analysis. Following treatment, 24 participants completed the post-

treatment online questionnaire, which included a series of open-ended questions eliciting

qualitative data in typed form. Open-ended questions were designed to elicit participant

narratives pertaining to treatment experiences and how Internet gambling participation may

influence the treatment of problem gambling behaviours. Participants were asked to answer four

open-ended questions with as much detail as possible. The four open-ended questions included:

1. What components of treatment were helpful? Why?

2. What components of treatment were not helpful? Why?

3. If you have been able to control or significantly cut back your Internet gambling

    behaviours over the course of treatment, how have you been able to do this (i.e.,

    strategies)?

4. If you have not been able to begin to control or significantly cut back your Internet

    gambling behaviours over the course of treatment, what have been your biggest

    obstacles?

Qualitative data was analysed and interpreted using a step-by-step guide of thematic analysis as described by Braun and Clarke (2006). Thematic analysis provides a structured means of identifying, analyzing, and detailing themes reflected within qualitative data. The analysis was inductive, as the purpose of the study was not to test hypotheses nor construct or examine theory, but to explore and describe repeated patterns of meaning (i.e., commonly recurring themes) identified in the data. Thus, the specific coding template developed a priori was not based on pre-existing theory, or through an examination of the existing literature, but simply guided by the identified research questions. As a result, it was decided that analysis would be data-driven and that themes would only be identified if they reflected participants' treatment experiences and how the Internet gambling participation may influence the treatment of problem gambling behaviours.

The current researcher and an associate engaged in data analysis for the current study. The research associate utilized in this study was a graduate student in clinical psychology and had previously undertaken coursework in qualitative analysis, read and reviewed the step by step procedures of thematic analysis employed in the current study (Braun & Clarke, 2006), previously undertaken course work in cognitive and behavioural interventions, and had applied these interventions in both Master's and PhD level practicum. The initial stage of analysis was to combine participants' typed responses into a single database. Responses were exported from SurveyMonkey into a Microsoft word document and were initially sorted by question number. At this stage it was apparent that there was overlap in response content across questions and that

identifying themes based on qualitative data from specific questions would not be practical. The second stage involved becoming familiar with the data set, as both the researcher and associate independently immersed themselves in the data through repeated readings and note taking on potential codes and themes in the data. Third, the researcher and associate independently began to code the data. Coding involved identifying features of semantic content within the data that appeared relevant to the specific research area of interest. This process required the researcher and associate to constantly move back and forth between the data set and the tracking of identified codes. To help with this process a color-coding strategy was utilized. Next, the researcher and associate independently examined the patterns between coded responses to identify general themes within the data. Codes were analyzed to determine how they could be combined to form overarching themes. At this stage tables were used to help sort and visualize how codes might come together to form themes. Lastly, the researcher and associate collaboratively examined and discussed their independently generated codes and overarching themes. During collaboration it was apparent that the generation of codes was fairly consistent between raters, aside from a few variations in phrasing of codes. In regards to the generation of overarching themes, the two raters differed on whether or not two themes should be collapsed into a single theme. Moreover, the specific naming of overarching themes was addressed, as there was understandably variation between raters in the specific names that should be used to define themes. These differences were discussed and addressed during collaboration. Actual participant narratives are reported in the results section to support identified themes.

Results

Data Screening

Prior to data analyses, data were downloaded from SurveyMonkey into a series of SPSS data files, which were then amalgamated into a single SPSS data file. Within this data file a number of variables were relabelled and recoded. These steps were repeated to ensure that they were done accurately and correctly. Descriptive statistics and frequencies of the variables were computed and examined to detect univariate outliers and missing data. No univariate outliers were detected. If a participant failed to answer two or fewer items from the PRF Desirability scale, PRF Infrequency scale, AUDIT, *DSM-IV* criteria for pathological gambling, or any of the SCL-90-R dimensions, those items were replaced with the participant's average score from that particular scale. If the participant failed to answer more than two items from any one of these scales, that total scale score was not calculated for the participant. Infrequency item scores were totalled to examine whether any participants had endorsed over three items on the Infrequency scale. No participants were identified as endorsing three or more Infrequency items. Finally, a series of Kolmogorov-Smirnov normality tests showed that all but one, *DSM-IV* criteria for pathological gambling, of the main continuous variables in the current study was normally distributed. The Kolmogorov-Smirnov normality test is a very conservative test of normality and these findings provide support for the utilization of parametric analyses in the current study (Tabachnick & Fidell, 2007).

Quantitative Analyses

Pre-treatment group differences. A series of independent sample *t*-tests and chi-square tests were conducted to examine pre-treatment differences between the treatment group and control group (Table 2). No significant group differences were found on demographic variables

Table 2

Pre-treatment Characteristics of the Treatment and Control groups (N =32)

	Group					
Variable	Treatment (*n* = 16)	Control (*n* = 16)	*t*	*df*	χ^2	*p*
Age (years)	*M* = 36.69 (*SD* = 8.01)	*M* = 31.81 (*SD* = 5.79)	1.974			.058
Gender % Male	9 (56.25%)	8 (50.00%)		1	.125	.723
Marital status						
% Unmarried/not Common-law	7 (43.75%)	5 (31.25%)				
% Married/Common-law	6 (37.5%)	10 (62.5%)				
% Separated/Divorced	3 (18.75%)	1 (6.25%)				
Ethnicity						
% Caucasian/white	12 (75%)	11 (68.75%)				
% African-Canadian/black	0	1 (6.25%)				
% Hispanic/Latino	0	2 (12.5%)				
% Aboriginal (First Nation or Inuit)	4 (25%)	2 (12.5%)				
Employment						
% Employed	12 (75%)	12 (75%)				
% Unemployed	4 (25%)	4 (25%)				
% Student	2 (12.5%)	6 (37.5%)				
Psychopathology measures						
AUDIT	*M* = 7.13 (*SD* = 6.02)	*M* = 9.56 (*SD* = 4.56)	1.291	30		.207
SCL-90-R GSI	*M* = 0.50 (*SD* = 0.34)	*M* = 0.46 (*SD* = 0.27)	.389	28		.701
Personality Research Form						
Desirability	*M* = 8.04 (*SD* = 1.73)	*M* = 9.00 (*SD* = 2.13)	1.397	30		.173
Infrequency	*M* = 0.69 (*SD* = 1.01)	*M* = 0.31 (*SD* = 0.48)	1.337	30		.191
Outcome measures						
DSM-IV criteria	*M* = 6.50 (*SD* = 1.32)	*M* = 7.13 (*SD* = 1.41)	1.297	30		.205
Perception of control	*M* = 9.37 (*SD* = 1.29)	*M* = 4.58 (*SD* = 0.63)	1.394	30		.174
Desire to gamble	*M* = 8.56 (*SD* = 1.31)	*M* = 8.50 (*SD* = 1.03)	.150	30		.882
# of gambling sessions	*M* = 11.53 (*SD* = 4.00)	*M* = 11.75 (*SD* = 5.09)	.135	30		.893
Previous PG tx % Yes	5 (28.75%)	5 (28.75%)		1	1.00	1.00
Current PG tx goal % abstinence	8 (50.00%)	8 (50.00%)		1	1.00	1.00

Note: tx = treatment, PG = problem gambling.

including age, gender, and employment status. Nor were there any significant differences on pre-treatment scores on the AUDIT, SCL-90-R Global Severity Index, PRF Desirability Scale or PRF Infrequency Scale. In terms of gambling related and treatment seeking behaviours, there were no pre-treatment differences found on previous problem gambling treatment engagement or current gambling related treatment goals (gambling abstinence vs. gambling reduction), nor were there any significant group differences found on the four outcome measures.

Comparison of groups on post-treatment outcome measures. A one-way MANOVA was utilized to examine group differences on post-treatment outcome measures (*DSM-IV* criteria, urge to gamble, number of gambling sessions, and perception of control). Results showed that group had a significant main effect, $F(4, 21) = 2.7$, $p = .007$, Wilks' $\lambda = 0.53$, partial $\eta^2 = .47$. A series of post hoc univariate analyses were performed to examine the main effect of group on each of the four post-treatment outcome measures. Results showed a significant difference between group means on DSM-*IV* criteria for pathological gambling, $F(1, 24) = 10.384$, $p = .004$, partial $\eta^2 = .302$; perception of control over gambling, $F(1, 24) = 12.585$, $p = .002$, partial $\eta^2 = .344$; and number of sessions gambled, $F(1, 24) = 5.9$, $p = .023$, partial $\eta^2 = .197$. There was no significant difference between groups on desire to gamble, $F(1, 24) = 2.417$, $p = .133$. These findings indicate that, at post-treatment, the treatment group endorsed significantly fewer *DSM-IV* criteria, had higher levels of perceived control over their gambling, and participated in fewer gambling sessions than the control group following the waiting list period. In contrast, neither group significantly differed on their level of desire to gamble. See Table 3 for outcome measure means and standard deviations.

Clinically significant change. To examine clinically significant change between groups, post-treatment/post-waiting list endstate functioning was examined for three outcome measures:

Table 3

Means and Standard Deviations of the Outcome Measures across groups

	Pre-treatment	Post-treatment	3 months post-treatment
Treatment group			
DSM-IV criteria	6.5 (1.32)	2.13 (1.96)	1.94 (2.13)
Perception of control	0.94 (1.29)	5.07 (2.19)	5.46 (2.85)
Desire to gamble	8.56 (1.31)	4.47 (2.85)	4.08 (2.36)
# of gambling sessions	11.53 (4.00)	4.43 (4.80)	3.92 (5.13)
Control group			
DSM-IV criteria	7.13 (1.41)	5.14 (2.35)	
Perception of control	0.46 (0.63)	1.85 (2.58)	
Desire to gamble	8.50 (1.03)	6.47 (2.82)	
# of gambling sessions	11.75 (5.09)	10.71 (6.58)	
Both groups combined			
DSM-IV criteria	6.81 (1.38)		1.79 (2.02)
Perception of control	0.69 (1.03)		4.96 (2.79)
Desire to gamble	8.53 (1.16)		4.25 (2.45)
# of gambling sessions	11.64 (4.50)		4.15 (4.34)

DSM-IV criteria for pathological gambling, perception of control over gambling, and desire to gamble. Given that the endorsement of five or more *DSM-IV* criteria are needed for a diagnosis of pathological gambling, the criterion score utilized for this variable was less than five. In accordance with Ladouceur et al. (2003) the criterion scores utilized for perception of control over gambling and desire to gamble were set at seven or more and three or less respectively. No significant pre-treatment/pre-waiting list differences were found between groups on these variables. At post-treatment/post-waiting list significantly more treatment group participants (93.3%) than control group participants (28.6%) met the *DSM-IV* criterion score, Fisher's exact: $p < .001$. In other words, significantly more control group participants met *DSM-IV* criteria for pathological gambling at post-waiting list than did treatment group participants at post-treatment. No significant group differences were found for criterion scores on perception of control over gambling (33.3% of treatment group and 7.7% of control group met the criterion score) or desire to gamble (46.7% of treatment group and 15.4% of control group met the criterion score).

Treatment effects at post-treatment and three-month follow-up periods. Both groups were combined ($n = 24$) to examine the four outcome measures over time (pre-treatment, post-treatment, three-month post-treatment). A series of one-way repeated measure ANOVAs were utilized for these analyses. To help correct for a violation of sphericity a Greenhouse-Geisser correction was applied for the *DSM-IV* criteria for pathological gambling analysis. Results showed that time had a significant main effect on *DSM-IV* criteria, $F(1.42, 31.16) = 69.28$, $p < .001$, $\eta p^2 = .759$; perception of control $F(2, 40) = 46.88$, $p < .001$, $\eta p^2 = .701$; desire to gamble, $F(2, 40) = 27.9$, $p < .001$, $\eta p^2 = .583$; and number of sessions gambled, $F(2, 38) = 42.37$, $p < .001$, $\eta p^2 = .625$. A priori tests using a Bonferroni correction, adjusting alpha levels to 0.0125 (0.05/4), revealed significant differences in all four outcome measures between pre-treatment

and post-treatment time periods and between pre-treatment and three-month follow-up time periods. No significant differences were found between post-treatment and three-month follow-up time periods (Table 4). These findings indicate that the number of *DSM-IV* criteria endorsed, the degree in which participants desired to gamble, and the number of sessions gambled significantly decreased from pre-treatment to post-treatment and that these gains were maintained at three-month follow-up. Furthermore, participants' perception of control over gambling significantly increased from pre-treatment to post-treatment and this was also maintained at three-month follow-up.

Factors associated with treatment outcomes.

Demographics and pre-treatment measures. Pre- to post-treatment change scores were calculated to examine factors associated with treatment outcomes. First, a series of two-tailed Pearson product-moment correlation coefficients were conducted. Results showed that there were no significant correlations between any of the four dependent variable change scores and age, SCL-90-R score, AUDIT score or PRF desirability scale score (Table 5). Second, two-tailed independent sample *t*-tests were used to examine gender differences on dependent variable change scores. No gender differences were found (Table 6).

Number of treatment sessions attended. To examine the relationship between number of treatment sessions attended and pre- to post-treatment change scores, a series of Pearson product-moment correlation coefficients were conducted. No significant correlations were found (Table 5). To further examine the relationship between number of treatment sessions attended and treatment outcomes, a dichotomous variable was created allocating participants having completed one to six sessions to one group ($n = 12$) and participants having completed seven to

Table 4

Bonferroni Comparisons for Change in Dependent Variables between Pre-treatment, Post-treatment, and Three-month Follow-up Time Periods (n = 24)

Comparisons	Mean Difference in Outcome Measure	Std. Error	95% CI Lower Bound	95% CI Upper Bound
Pre-tx vs post-tx				
DSM-IV criteria	4.26**	.441	3.11	5.4
Perception of control	4.05**	.44	-5.19	-2.9
Desire to gamble	3.67**	.645	1.98	5.35
# of gambling sessions	7.83**	1.294	5.13	10.52
Pre-tx vs 3 month post-tx				
DSM-IV criteria	4.52**	.533	3.14	5.9
Perception of control	4.71**	.59	-6.26	-3.17
Desire to gamble	4.24**	.547	2.81	5.67
# of gambling sessions	8.42**	1.29	5.72	11.13
Post-tx vs 3 month post-tx				
DSM-IV criteria	.62	.28	-.99	.47
Perception of control	.67	.54	-.75	2.08
Desire to gamble	.57	.649	-2.27	1.13
# of gambling sessions	.60	.928	-2.54	1.34

Note: ** $p < .001$. tx = treatment.

Table 5

Correlations Between Pre- to Post-treatment Dependent Variable Change Scores and other Participant Variables

Variable	*DSM-IV* criteria	Perception of control	Desire to gamble	# of sessions gambled
# of treatment sessions attended	-.333	.351	-.316	-.339
Age	-.098	-.098	.028	-.303
SCL-90-R GSI	-.016	.057	.013	-.350
AUDIT	-.365	-.155	-.189	-.391
PRF Desirability	.021	-.152	-.074	-.203

Note: *$p < .05$

Table 6

Gender Differences on Pre- to Post-treatment Dependent Variable Change Scores

	Group				
Change Score	Male (*n* = 13)	Female (*n* = 11)	*t*	*df*	*p*
DSM-IV criteria	*M* = -4.99 (*SD* = 2.08)	*M* = -3.45 (*SD* = 1.44)	2.064	22	.051
Perception of control	*M* = 4.46 (*SD* = 2.22)	*M* = 3.36 (*SD* = 1.91)	1.284	22	.212
Desire to gamble	*M* = -3.85 (*SD* = 3.02)	*M* = -3.09 (*SD* = 3.14)	.599	22	.555
# of sessions gambled	*M* = -9.25 (*SD* = 4.52)	*M* = -4.25 (*SD* = 7.05)	2.015	20	.058

12 sessions to a second group ($n = 12$). No significant pre-treatment group differences were found on the four dependent variables. Two-tailed independent sample t-tests were used to examine group differences on dependent variable change scores and no group differences were found (Table 7).

Qualitative Analyses

Qualitative data was analysed using thematic analysis (Braun & Clarke, 2006). Themes were only identified if they reflected participants' treatment experiences, experiences in trying to decrease their problem gambling behaviours over the Internet, and how Internet gambling may influence the treatment of problem gambling behaviours. Five themes were identified within the data: (1) Internet gambling accessibility and problem gambling behaviours, (2) the lack of alternative activities, stress, and the importance of behavioural activation in reducing Internet gambling behaviours, (3) importance of behavioural strategies in reducing Internet gambling behaviours, (4) motivational interviewing and the importance of motivation for change early in treatment, and (5) the importance of support from group members and treatment success. Actual participant narratives are reported to support and provide context to identified themes.

Theme 1: Internet gambling accessibility and problem gambling behaviours. Several participants reported that the accessibility of the Internet and the convenience of gambling over the Internet makes avoiding or refraining from gambling more difficult. For example, a male participant related his experiences with giving up Internet gambling to his experiences with giving up tobacco cigarettes: "I quit smoking two years ago and quitting gambling is like quitting smoking… quitting gambling is like trying to quit smoking with a cigarette in your hand all the time. Wifi is that cigarette in your hand." As a result of easy accessibility and

Table 7

Number of Session Group Differences on Pre- to Post-treatment Dependent Variable Change Scores

	Group				
Change Score	Attended 1-6 tx sessions (*n*=12)	Attended 7-12 tx sessions (*n*=12)	*t*	*df*	*p*
DSM-IV criteria	*M* = -3.83(*SD* =2.04)	*M* = -4.74(*SD* =1.81)	1.153	22	.261
Perception of control	*M* = 3.67(*SD* =2.53)	*M* = 4.25(*SD* =1.65)	.667	22	.512
Desire to gamble	*M* = -3.25(*SD* =3.41)	*M* = -3.75(*SD* =2.73)	.396	22	.696
# of sessions gambled	*M* = -6.54(*SD* =7.90)	*M* = -7.5(*SD* =3.60)	.353	20	.728

Note: tx = Treatment

convenience, it seems that for some participants Internet gambling has become associated with multiple contexts in their lives. One participant reported: "going to the casino is much easier to avoid. I have access to the Internet everywhere. Gambling has become associated with my home, computer, and phone". Another participant alluded to the fact that Internet access is often required to fulfil day-to-day obligations: "At work I have to be on the Internet because everything I do depends on it. For a long time I bet on sports at work".

Theme 2: The lack of alternative activities, stress, and the importance of behavioural activation in reducing Internet gambling behaviours. Participants often reported that their environment, and the context in which they spend their time, impacts their engagement in Internet gambling behaviours. For instance, boredom, and a lack of alternative activities, were frequently identified as impediments to changing maladaptive Internet gambling behaviours. It seemed that for some participants gambling had become their main source of entertainment or excitement in their lives: "hardest part for me is when I am looking for something to do at home or I am bored a lot. Feel like I want that excitement". Other participants identified gambling over the Internet as a quick way to escape stress or regulate difficult emotions: "betting allows me to get away from thinking about stressful things like the amount of work I have to do and how far I have fallen behind in bills". It was apparent from a number of participant responses that a change of context was often beneficial when trying to avoid the urge to gamble over the Internet. A number of participants stated that finding alternative activities to gambling was beneficial for them and this often included the engagement in more prosocial activities such as spending time with friends or family members and exercising, activities that could also help with managing stress. For example, a female participant reported "[I] really focused on filling my time with other activities, including spending more time with family and a few non-gambling friends".

Theme 3: Importance of behavioural strategies in reducing Internet gambling behaviours. Participants frequently reported that an important component of treatment, especially during the early stages, was to modify their environment and behaviours in ways that made it more difficult for them to gamble during high-risk situations (e.g., urge to gamble, exposure to gambling). In responding to the question, what components of treatment were most helpful, one male participant simply wrote, "looking at high-risk times and problem solving/planning ahead to make sure I do not gamble". Despite the Internet providing participants with increased access to gambling activities, many participants reported utilizing behavioural strategies to help them avoid or refrain from gambling over the Internet. The behavioural strategies usually focused on either limiting their access to the Internet gambling activity or limiting the financial resources required to participate in the Internet gambling activity. Strategies included leaving their laptop at work to avoid having access to a computer at home, blocking personal access to gambling accounts, cancelling credit-card accounts, and employing limit-setting options on Internet gambling websites such as limiting the dollar amount they can gamble in a day. Family members and friends were often utilized for support, and to help carry out behavioural strategies, such as having a friend in place to contact in case of a strong urge to gamble and having family members hold onto money for them.

Theme 4: Motivational interviewing and the importance of motivation for change early in treatment. While a number of respondents reported that all aspects of the treatment program were helpful, the motivational interviewing aspects of the treatment program were often identified as particularly helpful by increasing their motivation for positive behaviour change. Some participants specifically acknowledged the value in overtly examining the pros and cons of continued gambling engagement: "Looking at the pros and cons to gambling early in treatment

was a good start for me. I knew that I had to do something about gambling, but laying out the advantages and disadvantages seemed to be helpful". Respondents also identified the importance in exploring personal values and long-term goals. For example, one participant reported, "it was helpful to look at my life goals and how gambling a lot does not really fit in with them", while another reported that the most important part of treatment for them was "considering my values in life and long-term goals. How gambling is keeping me stuck in [not] moving forward".

Theme 5: The importance of support from group members. Participants frequently identified support and encouragement from fellow group members, as well as the group therapist, as important therapeutic factors in treatment. For example, several participants stated that listening to other group members talk about their struggles with gambling helped them feel less alone in trying to overcome their own gambling issues: "it… helped to have the support of other group members because they have a pretty good idea as to what I am going through". Furthermore, some participants reported that they learned from other group members, helping them develop insight into their own struggles with gambling: "It was a good group even though there was only three of us - we supported each other and learned from each others' experiences in an issue that we all struggled with. I can honestly say that I have a better understanding of why I gamble". Some participants even alluded to a strong sense of group cohesion within the group, making statements to suggest that group members were in this together. For example, a female participant stated "[another group member] and I worked hard at it together and are improving our lives".

Discussion

Cognitive behavioural therapy has been the most extensively studied treatment for problem gambling, with numerous studies supporting its efficacy (e.g., Dowling et al., 2007;

Jimenéz-Murcia et al., 2007; Ladouceur et al., 2003). Over the last 20 years, Internet gambling has been developed and has rapidly expanded into a multi-billion dollar industry. Despite research finding a strong relationship between Internet gambling participation and problem gambling behaviours (e.g., Gainsbury et al., 2013; Griffiths & Barns, 2008; Griffiths et al., 2009; Wood & Williams, 2011), no study to date has examined the efficacy of treatment for problem Internet gamblers. The primary purpose of the present study was to examine the efficacy of group CBT for self-identified problem Internet gamblers. The secondary purpose of the present study was to qualitatively examine participants' perspectives on their treatment experiences, and the aspects of treatment perceived as helpful in decreasing problem Internet gambling behaviours.

Participants included 32 self-identified Internet gamblers who were interested in receiving treatment for problem gambling. Participants were randomly assigned to either the treatment ($n = 16$) or wait-list control group ($n = 16$). Participants assigned to the treatment group underwent 12 weekly sessions of group CBT for problem gambling. Those assigned to the wait-list control underwent 12 weekly sessions of group CBT following a 12-week waiting period. Participants completed a series of outcome measures including the *DSM-IV* criteria for pathological gambling, perception of control over gambling, desire to gamble, and number of sessions gambled at pre-test/pre-treatment and post-test/post-treatment. Groups did not significantly differ on any of the outcome measures at pre-test measurement. Participants also completed outcome measures three months post-treatment. For the qualitative component of the study participants responded to four open-ended questions following treatment. These questions were designed to elicit participant narratives pertaining to treatment experiences and how

Internet gambling participation may influence the treatment of problem gambling behaviours. Thematic analysis was utilized to analyze qualitative data.

Quantitative results indicated that the treatment was efficacious in improving three of the four dependent variables from pre- to post-test/treatment: number of *DSM-IV* criteria for pathological gambling endorsed, perception of control over gambling, and number of sessions gambled. Groups were combined to examine treatment outcome over time, with results showing significant pre- to post-treatment and pre- to three-month post-treatment improvement in all four dependent variables. Qualitative results indicated five themes: (1) Internet gambling accessibility and problem gambling behaviours; (2) the lack of alternative activities, stress, and the importance in behavioural activation in reducing Internet gambling behaviours; (3) importance of behavioural strategies in reducing Internet gambling behaviours, (4) motivational interviewing and the importance of motivation for change early in treatment; and (5) the importance of support from group members.

This treatment outcome study was the first reported to have included a sample consisting entirely of problem gamblers who gamble over the Internet. Findings support the efficacy of cognitive behavioural group therapy for problem Internet gamblers. However, despite positive treatment outcomes, many participants in the current study reported that easier access to gambling via the Internet did add to the complexity of learning how to manage their problem gambling behaviours.

Efficacy of group CBT for problem Internet gamblers

Overall, the results of the current study are consistent with previous research demonstrating the efficacy of group CBT for problem gambling (Carlbring et al., 2010; Dowling et al., 2007; Ladouceur et al., 2003; Myrseth et al., 2009). However, unlike previous studies, the

aim of the current study was to examine the efficacy of group CBT for problem gamblers who gamble over the Internet. Previous treatment outcome studies have most certainly included problem gambling participants who gamble over the Internet, many of whom likely utilize the Internet for gambling to varying degrees (Wardle et al., 2011). Some may solely gamble on the Internet, others may frequently to rarely gamble on the Internet and also gamble at land-based venues, and others may only gamble at land-based venues. The current study utilized a sample of participants who self-identified as Internet gamblers and who had reported gambling on the Internet to some degree over the previous 12 months. To the current author's knowledge, this was the first treatment study that utilized a sample entirely made up of Internet problem gamblers. Given the characteristics of Internet gambling such as unlimited access and convenience, the ability to gamble on credit, faster pace of play, a wider range of gambling activities, and an easier means of hiding excessive gambling from others, some have argued that the Internet may make for a more addictive and potentially problematic experience than land-based venues (Gainsbury et al., 2013; Griffiths & Barns, 2008; McCormack et al., 2013). From this perspective, one could argue that problem Internet gambling behaviours may be less responsive to current evidence-based problem gambling treatments. The current study suggests that group CBT is helpful for problem Internet gamblers.

Attrition. Research has shown high attrition rates in problem gambling treatment usually ranging from 30% to 50% (Ladouceur et al., 2001; Melville et al., 2007). Treatment studies examining the efficacy of group CBT for problem gambling have shown similar rates at post-treatment and follow-up periods (Carlbring et al., 2010; Dowling et al., 2007; Jimenéz-Murcia et al., 2007; Ladouceur et al., 2003; Oei et al., 2010). High attrition at post-treatment and follow-up limit the conclusions from the findings of these studies. However, the issue whether to include

participants who do not provide outcome follow-up data is a controversial one. While study

participants who dropout may be less likely to realize treatment success, it is also likely too

stringent to assume them to be treatment failures (Dowling et al., 2007; Stinchfield & Winters,

2001). That said, intent-to-treat analyses are sometimes utilized in problem gambling treatment

research (e.g., Myrseth et al., 2009; Oei et al., 2010; Petry et al., 2008). The current study's

attrition rates are less than those previously reported as 23 of 24 (95.8%) and 22 of 24 (91.7%)

participants who participated in treatment completed post-treatment and three-month post-

treatment follow-up measures respectively. High retention rates observed in the current study are

likely, at least partially, the result of the data collection methods utilized. An e-mail asking

participants to complete post-treatment and three-month follow-up measures was sent to

participants, along with a link to the measures available on SurveyMonkey. If participants did

not complete the online measures within three days they were sent a reminder e-mail. To

complete these measures it usually took participants between five to ten minutes, and as

incentive for completing these measures participants received a $20 gift certificate. As a result of

utilizing e-mail, some participants completed post-treatment and three-month follow-up

measures despite not attending the final treatment session or having previously discontinued

treatment. E-mail and online questionnaires may have been particularly effective for this group

given their apparent comfort level with technology and the Internet. From this perspective,

Internet-based interventions may be particularly appealing among problem Internet gamblers.

Much like Internet access provides boundless opportunity for gambling activities, the Internet

also has huge potential as a medium for treatment (Castrén et al., 2013). Pervious research has

shown Internet-based CBT programs to be effective for problem gambling (Carlbring & Smit,

2008). Furthermore, Internet-based treatments may also help improve treatment retention rates

among this population (Gainsbury & Blaszczynski, 2011). Future problem gambling outcome studies may want to utilize similar data collection methods to those utilized in the current study to help improve study retention rates at post-treatment and follow-up time periods. Moreover, research should continue to examine Internet-based treatments for problem gambling, in particular for those whom gamble over the Internet.

Number of sessions attended and treatment outcome. In the current study, the number of treatment sessions attended was not significantly correlated with pre- to post-treatment change scores for any of the four dependent variables. Furthermore, no pre- to post-treatment change scores significantly differed between participants who attended one to six sessions and those who attended seven to 12 sessions. These findings suggest that treatment "dose" did not affect treatment outcome on any of the four treatment outcomes observed. Findings have been previously reported that suggest a higher dose of psychological treatment for problem gambling is not always more effective (Gooding & Tarrier, 2009). For example, Carlbring et al. (2010) found that eight weekly three-hour sessions of group CBT was no more effective than four bi-weekly 50-minute sessions of MI. In another study, Petry et al. (2008) found that participants assigned to very brief therapy consisting of an initial evaluation followed by a ten minute psychoeducational session about problem gambling (i.e., importance of limiting the amount of money and time spent gambling, the importance of not viewing gambling as a way to make money, and the importance of engaging in activities other than gambling) showed better problem gambling outcomes than participants assigned to one session of MI plus three sessions of CBT. While Petry et al.'s findings may not be that applicable to the current study, as these authors utilized a sample of problem gamblers that were not actively seeking problem gambling treatment, these findings do demonstrate that brief doses of treatment can be helpful for some

problem gamblers. It may be the case for some problem gamblers that once they make the decision to seek treatment they will reduce their problem gambling behaviours regardless of the dose of treatment they receive (Petry, 2005). After all many problem gamblers have been reported to improve their problem gambling behaviours after only engaging in an initial assessment interview prior to being assigned to a wait-list control group (Hodgins et al., 2001). Such findings can also be due to the process of natural recovery, as many problem gamblers will recover over time without formal treatment (Toneatto et al., 2008). Regardless, future research should further examine the efficacy of brief interventions for problem gambling as they are cost effective and may be more appealing to those uncertain about engaging in treatment.

Although there were no significant correlation coefficients found between number of treatment sessions attended and dependent variable pre- to post-treatment change scores, each of these four correlation coefficients were approaching significance (p = .093 to .133) and ranged from .316 to .351. In other words, despite not achieving significance, the direction and magnitude of these correlation coefficients showed a trend in that improvements in each of the four outcome measures were "almost" found to be associated with more treatment sessions attended. As a result, an alternative explanation for why significant correlations were not found between these variables was that the sample size (n = 24) might not have been large enough to obtain adequate power for these analyses. Comparable correlation coefficients between treatment dose and post-treatment and follow-up gambling frequency scores have been found to be statically significant in problem gambling treatment studies that have utilized larger samples (Toneatto & Dragonetti, 2008).

Pre-treatment measures associated with treatment outcomes

Despite no significant correlation coefficients between pre- to post-treatment dependent variable change scores and other participant variables measured at pre-treatment, two correlations that approached significance are worth noting. First, the correlation between pre- to post-treatment change in number of sessions gambled and pre-treatment SCL-90-R GSI score (r = -.35, p =.12) and second, the correlation between pre- to post-treatment change in number of sessions gambled and pre-treatment AUDIT score (r = -.39, p = .072). Despite not being significant, the direction and magnitudes of these correlations suggest that there was a trend in that participants scoring lower on general psychiatric symptomatology at pre-treatment and participants scoring lower on alcohol consumption and alcohol related problems at pre-treatment reported more improvement in pre- to post-treatment change in number of sessions gambled. These correlations are important, as these relationships are often not reported in problem gambling literature. The directions of these relationships are consistent with some studies that have found a higher level of psychopathology and substance use to be associated with poorer problem gambling treatment outcomes (Echeburua et al., 2001; Milton et al., 2002; Raylu & Oei, 2007; Tolchard & Battersby, 2013).

Participant perspectives on treatment experiences

Following treatment, participants completed a series of open-ended questions eliciting qualitative data regarding their treatment experiences and experiences in reducing their problem gambling behaviour over the Internet. Thematic analysis was carried out, identifying five themes: Internet gambling accessibility as a means to problem gambling behaviour; a lack of alternative activities, stress, and the importance of behavioural activation in reducing Internet gambling behaviours; the importance of behavioural strategies in reducing Internet gambling

behaviours; the importance of motivational interviewing and motivation for change early in treatment; and the importance of support from other group members were identified. Overall, these themes help provide a better understanding of which aspects of treatment were perceived as most helpful by participants, and how Internet gambling participation may have affected these participants' treatment experiences and outcomes.

Internet access and gambling participation. It has been well documented that Internet technology has the potential of making gambling more addictive and problematic than land-based gambling venues (Gainsbury et al., 2013; Griffiths & Barns, 2008; McCormack et al., 2013). An emerging theme from the data was that participants perceived increased accessibility to gambling activities via the Internet as an impediment to decreasing gambling participation. As highlighted by Blaszczynski and Nower (2002), increased availability and accessibility are central to a pathways model of problem gambling. Findings from McCormack and Griffiths (2012) indicate that a major motivating factor for why many gamblers chose to gamble on the Internet is that it provides a greater opportunity to gamble. It seems that the primary lure to Internet gambling, easy access, may also be a major obstacle to reducing gambling involvement for those whom gambling has become problematic. Not surprisingly, easy access to the Internet has also been identified as a challenge by cognitive-behavioural therapists in the treatment of generalized Internet addiction and other, more specific, Internet addictions (e.g., pornography), especially in the early stages of treatment (van Rooij, Zinn, Schoenmakers, & van de Mheen, 2012). Easy access to the Internet is most certainly an important factor in the maintenance of maladaptive Internet engagement, in the case of the current study – Internet problem gambling, seemingly makes the treatment of such maladaptive behaviours more challenging.

Behavioural strategies and decreasing Internet gambling participation. A prominent component of many CBT programs for addiction is the development of strategies that can be utilized by clients to help them avoid high-risk situations. However, it would appear that merely access to the Internet might be a high-risk situation for some problem Internet gamblers. As previously discussed, this is of concern given that the Internet is both readily accessible and necessary for most individuals in society, making the management of problem gambling more complex. Another emerging theme was the importance of utilizing creative behavioural strategies intended to minimize exposure to gambling opportunities, most notably Internet gambling activities. For example, leaving one's laptop computer at work to reduce access to the Internet while at home. Such strategies have been reported as helpful in the treatment of more generalized Internet addiction as well (van Rooij et al., 2012); however, unlike a more general Internet addiction, a financial means in addition to Internet access is required to gamble online. It was also identified within the data that participants found it helpful to limit their access to gambling funds. For example, cancelling credit cards and having trusted family members hold onto their money, strategies that can also be helpful for land-based problem gamblers (Ladouceur & Lachance, 2007).

In line with behavioural strategies for reducing problem Internet gambling, the importance of engaging in more prosocial activities was identified. Participants gave a number of reasons why they gamble including a lack of alternative activities to alleviate boredom and to escape from stressful life events. Chronic Internet use and excessive gambling have both been reported as a means to help alleviate boredom and as a distraction from life events (Dunn, Delfabbrto, & Harvey, 2012; van Rooi et al., 2012). Previous research examining the process of recovery from gambling problems has identified the engagement in new prosocial activities as an

important factor for many problem gamblers (Hodgins & El-Guebaly, 2000). Problem gamblers often report less social support and can become socially isolated over time, engaging in fewer alternative activities at the expense gambling participation (Wiebe, Cox, & Falkowski-Ham, 2003). What is more, while land-based problem gamblers are at least forced to leave their home to gamble, many Internet problem gamblers are able to gamble excessively at home by themselves. Davis (2001) describes a cognitive-behavioural model of pathological Internet use that indicates social isolation and lack of social support as primary risk factors for the development of pathological Internet use. Over time increased Internet use leads to disengagement from alternative, non-Internet activities, and further social isolation. Treatments need to facilitate the disruption of this cycle, helping clients move toward filling their free time with more prosocial activities that can help with alleviating boredom and regulating stress.

Motivational interviewing and motivation for change early in treatment. In addition to the importance of behavioural strategies, the importance of motivational interviewing and motivation for change early in treatment was an emergent theme. Motivational enhancement therapy or MI has been shown to be an effective treatment for some problem gamblers and is often utilized in the initial sessions of more comprehensive problem gambling CBT programs to help create further client motivation toward changing problem gambling behaviours (Carlbring et al., 2010). The first session of the treatment program utilized in the current study (Ladouceur & Lachance, 2007) includes a series of MI exercises and discussion points designed to enhance client motivation for change. Given high dropout rates that are often observed in only the first few weeks of problem gambling treatment, a finding that has been attributed to poor motivation for change (Dowling et al., 2007; Jimenéz-Murcia et al., 2007; Robson, Edwards, Smith, & Colman, 2002), it has been argued that MI strategies should be utilized at the earliest stages of

client contact to help increase client motivation to remain in treatment (Dowling et al., 2007). Furthermore, higher levels of motivation for changing problem gambling behaviours at the beginning of treatment have been found to be associated with improved treatment outcomes (Petry, 2005) and lack of readiness for change early in problem gambling treatment has been shown to be associated with treatment dropout (Tolchard & Battersby, 2013). Future research should continue to examine how the employment of MI may influence problem gambling treatment dropout rates.

Group support. Although it is not a specific therapeutic component of the program manual utilized in the current study (Ladouceur & Lachance, 2007), another important therapeutic factor identified in the data was the support and role of other group members. Some participants may have been apprehensive to engage in group therapy, as reported by problem gambling participants in Carlbring et al. (2010); however, it seems that for many participants in the current study attending group therapy was a positive experience. As part of the treatment employed in the current study, participants were provided with the opportunity at the beginning of each session to discuss homework assigned for the previous week, along with any thoughts or feelings associated with their attempts to refrain from engaging in gambling activities. Piquette-Tomei et al. (2008) found that female problem gamblers identified group process as an important therapeutic factor in group therapy. In their study participants reported that a safe therapeutic space that provided acceptance, along with the opportunities to share personal information, gain insight from others' experiences, and receive feedback were all helpful aspects of treatment. Participant narratives from Piquette-Tomei et al.'s study shared similar content to participant qualitative responses in the current study. Yalom (1995) states that providing group members with meaningful opportunities for group process is an important component of group therapy.

Group process helps group members relate to one another's experiences, develop group cohesion and develop an engaging group climate. Yalom argues that such group characteristics contribute to the individual empowerment of group members, resulting in positive behavioural change. Previous group CBT problem gambling treatment studies have rarely reported the degree to which group members were given time to discuss treatment content and relevant real life experiences (e.g., Jimenéz-Murcia et al., 2007; Ladouceur et al., 2003). It is important that future research report therapeutic techniques administered specifically to group CBT conditions (e.g., strategies to develop group cohesion). Such reporting is important to further replicate promising research findings and develop evidence-based treatment protocols specific to group therapy for problem gambling.

Limitations

In light of the implications of the current study, there are a few limitations that should be acknowledged. First, due to the challenge of recruiting problem gamblers interested in receiving treatment (Dowling et al., 2007; Myrseth et al., 2009), as discussed above the sample size of this study might not have been large enough to achieve statically significant correlation coefficients between some of the variables observed. Small sample sizes have often been identified as a limitation in this area of research (Toneatto & Ladouceur, 2003). It is important that future studies using larger sample sizes be conducted to replicate these findings.

Second, although all participants in the current study self-identified as Internet gamblers, Internet gambling frequency was not adequately measured. Although a questionnaire asking participants about their specific Internet gambling participation over the previous year was employed (see Appendix C), it became evident throughout the study that this questionnaire was not reliable. For example, several participants reported having had concerns about their ability to

recall their previous gambling participation as it was asked of them by this questionnaire. As a result, several participants reported that they were not confident in their responses, and thus, it was decided that this data would not be utilized in the current study. As problem Internet gamblers gamble over the Internet to varying degrees, it is important for future research to better measure the frequency of Internet gambling involvement.

Third, post-treatment follow-up periods in the current study were limited to three-months. Although six-month post-treatment data is being collected for the current study, due to this data collection not yet having been completed, along with the time restraints on the completion of this document, six-month follow-up analyses were not included in the current study. Previous treatment outcome studies examining the efficacy of problem gambling treatments have employed follow-up periods ranging from no follow-up to 24 months post-treatment. Given the episodic nature of problem gambling behaviours, longer follow-up periods are beneficial in this population (López Viets & Miller, 1997). However, historically problem gambling treatment studies have typically suffered from high attrition rates at follow-up time periods, particularly follow-up periods of a longer duration, limiting post-treatment follow-up findings. A particular strength of the current study is the low attrition rates observed at post-treatment and three-month follow-up time periods. Future studies should look to replicate these findings utilizing loner-term follow-up.

Finally, due to the ethical concerns with assigning problem gambling participants to a wait-list control for an extended period of time, there was no control group comparison at three-month follow-up in the current study. As a result, improvements in outcome measures at three-months post-treatment could not be definitively attributed to the treatment provided. A next step in problem Internet gambling treatment outcome research is to assign participants to multiple

treatment groups so that between group comparisons on outcome measures can be made at post-treatment follow-up periods.

Conclusion

In conclusion, this treatment outcome study is the first reported to have included a sample consisting entirely of problem gamblers who gamble on the Internet. Findings support the efficacy of cognitive-behavioural group therapy for self-identified problem Internet gamblers as indicated by significant improvements in *DSM-IV* criteria for pathological gambling, perceptions of control over gambling, and number of sessions gambled. Participant reports suggest that although Internet access made refraining from gambling activities more challenging, treatment was perceived as helpful in decreasing Internet gambling participation among participants. Although many participants perceived all treatment components as helpful, in particular, participants identified behavioural strategies, motivational interviewing, and group support as important therapeutic factors contributing to improved outcomes. Overall, despite positive treatment outcomes, it would appear that for many participants in the current study, Internet gambling did add to the complexity of learning how to manage their problem gambling behaviours.

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Appendix A

Lakehead
U N I V E R S I T Y

Do you gamble on the Internet?

Does your gambling negatively affect you or your family?

If you answered yes to each of these questions you are not alone. Problematic Internet gambling behaviours can have negative financial, psychological, and social effects on an individual and an individual's family.

The purpose of this study is to examine the effectiveness of psychological treatment for problem Internet gambling.

To participate in this study you must be 19 years of age or older, gamble over the Internet, and want to participate in psychological treatment for problem gambling.

Participation in this study involves engaging in 12 sessions of Cognitive Behavioural group Therapy at Lakehead University and completing a series of short questionnaires over the course of the study.

This treatment has been shown to be effective for problem gamblers.

For more information about this study e-mail:

nharris@lakeheadu.ca

Thank you sincerely for your interest in this study
This study is being conducted by:

Dr. Dwight Mazmanian
(Associate Professor of Psychology)

Mr. Nick Harris
 (B.A. Hons., M.A., PhD Candidate)

If you have any questions, please do not hesitate to call or email:
Dr. Dwight Mazmanian
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Nick Harris
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Appendix B

Demographic Questionnaire

Please indicate your response by putting a check mark in the circle next to the statement you agree with. All information is confidential and anonymous and only our research team at Lakehead University will have access to this information.

1. Sex:
   O Male
   O Female

2. Age: _____

3. What is your ethnic background?

   O Caucasian/White   O Middle Eastern

   O African-Canadian/Black   O East Indian

   O Hispanic/Latino   O Other

   O Asian   Please specify: _____

   O Aboriginal (First Nation or Inuit)

4. Marital Status:

   O Single

   O Married/Common-law

   O Separated or divorced

   O Widowed

5. Do you currently hold a job?

    ○ I do not hold a job

    ○ I have one part-time job

    ○ I have one full-time job

    ○ I have more than one part-time job

    ○ I have more than one full-time job

6. Are you currently a University or College student?

    ○ Yes

    ○ No

Appendix C

Gambling Participation and Previous Treatment Questionnaire

The following questions relate to your gambling behaviours over the past 12 months.

OVER THE PAST 12 MONTHS…

1. *In the past 12 months*, how many days per month have you played the following gambling games at a land-based venue (e.g., casino, VLTs, electronic gaming machine, bingo) *for money*?

	# of days per month you played this game *not* over the Internet (0-30 days)
Poker ………………………………………	_____
Roulette ………………………………….	_____
Slot machines……………………………….	_____
Video lottery terminals (VLTs)……………	_____
Blackjack …………………………………..	_____
Electronic gaming machines………………	_____
Bingo ……..……………………………….	_____
Sports betting ……………………………	_____
Horse racing ……………………………..	_____
Other please specify: _____	_____

The following two questions refer to GAMBLING ON THE INTERNET FOR MONEY.

2. How many days per month have you played the following gambling games on the Internet *for money*?

	# of days per month you played this game on the Internet (0-30 days)
Poker ……………………………………	_____
Roulette ………………………………….	_____
Slot machines……………………………….	_____

Video lottery terminals (VLTs)……………   _____

Blackjack ………………………………..   _____

Electronic gaming machines………………   _____

Bingo ………………………………..   _____

Sports betting …………………………   _____

Horse racing …………………………   _____

Other please specify: _____   _____

3. When gambling on the Internet *over the previous 12 months*, how often were you playing poker?
- O Exclusively Poker when gambling on the Internet

- O 71% to 99% of the time

- O between 30% and 70% of the time

- O 1% to 29% of the time

- O I never play poker on the Internet

4. Are you currently receiving or have you received any treatment for problem gambling **in the previous 12 months**?
- O Yes

- O No

If yes, Please specify (e.g., gambling anonymous, group therapy, individual therapy, medication, etc)

_____

5. **Before the previous 12 months**, have you received any treatment for problem gambling?
- O Yes

- O No

If yes, Please specify (e.g., gambling anonymous, group therapy, individual therapy, medication, etc)

_____

6. What are your **goals** for problem gambling treatment or what do you hope to get out of treatment? **(Can check more than one answer)**

○ No longer gambling at all

○ Be able to control my gambling behaviours

○ Reduce my gambling behaviours

○ Other Goal. Please specify: _____

Appendix D

DSM-IV-TR-Based Questionnaire

	Never	Yes, at some time in my life	Yes, in the past year	Yes, in the past month
1. Have you ever tried to cut down gambling, and then found that you couldn't?	0	1	2	3
2. Have you ever tried to cut down or stop gambling and found that you were restless or irritable?	0	1	2	3
3. Do you ever gamble as a way of escaping from problems in life or as a way of getting rid of unpleasant feelings?	0	1	2	3
4a. Have you ever lost a job or got into trouble at work because of gambling?	0	1	2	3
4b. Have you ever jeopardized or lost a marriage or other significant relationship because of gambling?	0	1	2	3
5. Have you ever committed a crime to get money for gambling (i.e., stealing, forgery, fraud, etc.)?	0	1	2	3
6. Do you find yourself thinking often about gambling, such as reliving past gambling experiences, planning your next gambling venture, or thinking of ways to get money with which to gamble?	0	1	2	3
7. Do you find you need to gamble with increasing amounts of money in order to get the desired level of excitement?	0	1	2	3
8. Do you find yourself gambling in an attempt to recover your previous gambling losses?	0	1	2	3
9. Have you ever lied to family, friends, or others about your gambling?	0	1	2	3
10. Have you ever turned to family or friends to help you with financial problems that were caused by your gambling?	0	1	2	3

Please answer the following questions by checking either yes or no.

	Yes	No
11. Have you ever been seen by a mental health professional for any psychological problems? If yes, what type of problem(s) did you have?_____	O	O
12. Has anyone in your family EVER had a gambling problem?	O	O
13. Has anyone in your family EVER had an alcohol or drug problem?	O	O

Appendix E

DSM-IV-TR-Based Questionnaire (Only non-Internet gambling behaviours)

Complete this measure based on only your previous **non-Internet gambling behaviours.**	Never	Yes, at some time in my life	Yes, in the past year	Yes, in the past month
1. Have you ever tried to cut down gambling, and then found that you couldn't?	0	1	2	3
2. Have you ever tried to cut down or stop gambling and found that you were restless or irritable?	0	1	2	3
3. Do you ever gamble as a way of escaping from problems in life or as a way of getting rid of unpleasant feelings?	0	1	2	3
4a. Have you ever lost a job or got into trouble at work because of gambling?	0	1	2	3
4b. Have you ever jeopardized or lost a marriage or other significant relationship because of gambling?	0	1	2	3
5. Have you ever committed a crime to get money for gambling (i.e., stealing, forgery, fraud, etc.)?	0	1	2	3
6. Do you find yourself thinking often about gambling, such as reliving past gambling experiences, planning your next gambling venture, or thinking of ways to get money with which to gamble?	0	1	2	3
7. Do you find you need to gamble with increasing amounts of money in order to get the desired level of excitement?	0	1	2	3
8. Do you find yourself gambling in an attempt to recover your previous gambling losses?	0	1	2	3
9. Have you ever lied to family, friends, or others about your gambling?	0	1	2	3
10. Have you ever turned to family or friends to help you with financial problems that were caused by your gambling?	0	1	2	3

Appendix F

DSM-IV-TR-Based Questionnaire (Only Internet gambling behaviours)

Complete this measure based on only your previous **Internet gambling behaviours.**

	Never	Yes, at some time in my life	Yes, in the past year	Yes, in the past month
1. Have you ever tried to cut down gambling, and then found that you couldn't?	0	1	2	3
2. Have you ever tried to cut down or stop gambling and found that you were restless or irritable?	0	1	2	3
3. Do you ever gamble as a way of escaping from problems in life or as a way of getting rid of unpleasant feelings?	0	1	2	3
4a. Have you ever lost a job or got into trouble at work because of gambling?	0	1	2	3
4b. Have you ever jeopardized or lost a marriage or other significant relationship because of gambling?	0	1	2	3
5. Have you ever committed a crime to get money for gambling (i.e., stealing, forgery, fraud, etc.)?	0	1	2	3
6. Do you find yourself thinking often about gambling, such as reliving past gambling experiences, planning your next gambling venture, or thinking of ways to get money with which to gamble?	0	1	2	3
7. Do you find you need to gamble with increasing amounts of money in order to get the desired level of excitement?	0	1	2	3
8. Do you find yourself gambling in an attempt to recover your previous gambling losses?	0	1	2	3
9. Have you ever lied to family, friends, or others about your gambling?	0	1	2	3
10. Have you ever turned to family or friends to help you with financial problems that were caused by your gambling?	0	1	2	3

Appendix G

DSM-IV-TR-Criteria

Complete this measure based on all of your previous **gambling behaviours over the past 4-weeks.**

	Not in the past 4-weeks	Yes, in the past 4-weeks
1. Have you ever tried to cut down gambling, and then found that you couldn't?	0	1
2. Have you ever tried to cut down or stop gambling and found that you were restless or irritable?	0	1
3. Do you ever gamble as a way of escaping from problems in life or as a way of getting rid of unpleasant feelings?	0	1
4a. Have you ever lost a job or got into trouble at work because of gambling?	0	1
4b. Have you ever jeopardized or lost a marriage or other significant relationship because of gambling?	0	1
5. Have you ever committed a crime to get money for gambling (i.e., stealing, forgery, fraud, etc.)?	0	1
6. Do you find yourself thinking often about gambling, such as reliving past gambling experiences, planning your next gambling venture, or thinking of ways to get money with which to gamble?	0	1
7. Do you find you need to gamble with increasing amounts of money in order to get the desired level of excitement?	0	1
8. Do you find yourself gambling in an attempt to recover your previous gambling losses?	0	1
9. Have you ever lied to family, friends, or others about your gambling?	0	1
10. Have you ever turned to family or friends to help you with financial problems that were caused by your gambling?	0	1

Appendix H

DSM-IV-TR-Criteria (Only non-Internet gambling behaviours)

Complete this measure based on only your previous **non-Internet gambling behaviours over the past 4-weeks.**

	Not in the past 4-weeks	Yes, in the past 4-weeks
1. Have you ever tried to cut down gambling, and then found that you couldn't?	0	1
2. Have you ever tried to cut down or stop gambling and found that you were restless or irritable?	0	1
3. Do you ever gamble as a way of escaping from problems in life or as a way of getting rid of unpleasant feelings?	0	1
4a. Have you ever lost a job or got into trouble at work because of gambling?	0	1
4b. Have you ever jeopardized or lost a marriage or other significant relationship because of gambling?	0	1
5. Have you ever committed a crime to get money for gambling (i.e., stealing, forgery, fraud, etc.)?	0	1
6. Do you find yourself thinking often about gambling, such as reliving past gambling experiences, planning your next gambling venture, or thinking of ways to get money with which to gamble?	0	1
7. Do you find you need to gamble with increasing amounts of money in order to get the desired level of excitement?	0	1
8. Do you find yourself gambling in an attempt to recover your previous gambling losses?	0	1
9. Have you ever lied to family, friends, or others about your gambling?	0	1
10. Have you ever turned to family or friends to help you with financial problems that were caused by your gambling?	0	1

Appendix I

DSM-IV-TR-Criteria (Only Internet gambling behaviours)

Complete this measure based on only your previous **Internet gambling behaviours over the past 4-weeks.**

	Not in the past 4-weeks	Yes, in the past 4-weeks
1. Have you ever tried to cut down gambling, and then found that you couldn't?	0	1
2. Have you ever tried to cut down or stop gambling and found that you were restless or irritable?	0	1
3. Do you ever gamble as a way of escaping from problems in life or as a way of getting rid of unpleasant feelings?	0	1
4a. Have you ever lost a job or got into trouble at work because of gambling?	0	1
4b. Have you ever jeopardized or lost a marriage or other significant relationship because of gambling?	0	1
5. Have you ever committed a crime to get money for gambling (i.e., stealing, forgery, fraud, etc.)?	0	1
6. Do you find yourself thinking often about gambling, such as reliving past gambling experiences, planning your next gambling venture, or thinking of ways to get money with which to gamble?	0	1
7. Do you find you need to gamble with increasing amounts of money in order to get the desired level of excitement?	0	1
8. Do you find yourself gambling in an attempt to recover your previous gambling losses?	0	1
9. Have you ever lied to family, friends, or others about your gambling?	0	1
10. Have you ever turned to family or friends to help you with financial problems that were caused by your gambling?	0	1

Appendix J

THE AUDIT QUESTIONNAIRE

1. How often do you have a drink containing alcohol?

(0) Never   (1) Monthly or less   (2) 2-4 times/month   (3) 2-3 times/week   (4) 4+ times/week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

(0) 1 or 2   (1) 3 or 4   (2) 5 or 6   (3) 7 to 9   (4) 10 or more

3. How often do you have six or more drinks on one occasion?

(0) Never   (1) Less than monthly   (2) Monthly   (3) Weekly   (4) Daily or almost daily

4. How often, during the last year, have you found that you were not able to stop drinking once you had started?

(0) Never   (1) Less than monthly   (2) Monthly   (3) Weekly   (4) Daily or almost daily

5. How often, during the last year, have you failed to do what was normally expected of you because of drinking?

(0) Never   (1) Less than monthly   (2) Monthly   (3) Weekly   (4) Daily or almost daily

6. How often, during the last year, have you needed a first drink in the morning to get yourself going after a heavy drinking session?

(0) Never   (1) Less than monthly   (2) Monthly   (3) Weekly   (4) Daily or almost daily

7. How often, during the last year, have you had a feeling of guilt or remorse after drinking?

(0) Never   (1) Less than monthly   (2) Monthly   (3) Weekly   (4) Daily or almost daily

8. How often, during the last year, have you been unable to remember what happened the night before because you had been drinking?

(0) Never   (1) Less than monthly   (2) Monthly   (3) Weekly   (4) Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

(0) No   (2) Yes, but not in the last year   (4) Yes, during the last year

10. Has a relative, friend, doctor, or other health worker been concerned about your drinking or suggested that you should cut down?

(0) No   (2) Yes, but not in the last year   (4) Yes, during the last year

Appendix K

Gambling-Related Questions

For questions 1 and 2, circle the number that corresponds to the way that you have felt over the past week.

Perceived Control

1. To what extent do you feel that your gambling problem is resolved or under control?

    0------10------20------30------40------50------60------70------80------90------100%

    Not at all   A little   Moderately   A lot   Totally
    Resolved   Resolved

Urge to Gamble

2. To what extent have you felt the urge to gamble in the past week?

    0-------1--------2--------3-------4-------5-------6-------7--------8-------9-------10

    Not at all   A little   Moderately   A lot   Totally

Gambling Frequency

3. How many times have you gambled over the past 4 weeks? _____

4. How much time (hours and minutes) have you spent
    gambling over the past 4 weeks? _____ hours and _____ minutes

5. How much money have you wagered over the past 4 weeks? _____ dollars

Appendix L

The Symptom Checklist -90- Revised

		Example:			
0 = Not at all	**1 = A little bit**	**2 = Moderately**	**3 = Quite a bit**	**4 = Extremely**	
How much were you distressed by:					
Bodyaches		**0**	**1**	**2**	**③**	**4**

How much were you distressed by:

1	Headaches	0	1	2	3	4
2	Nervousness or shakiness inside	0	1	2	3	4
3	Repeated unpleasant thoughts that won't leave your mind	0	1	2	3	4
4	Faintness or dizziness	0	1	2	3	4
5	Loss of sexual interest or pleasure	0	1	2	3	4
6	Feeling critical of others	0	1	2	3	4
7	The idea that someone else can control your thoughts	0	1	2	3	4
8	Feeling others are to blame for most of your troubles	0	1	2	3	4
9	Trouble remembering things	0	1	2	3	4
10	Worried about sloppiness or carelessness	0	1	2	3	4
11	Feeling easily annoyed or irritated	0	1	2	3	4
12	Pains in chest or heart	0	1	2	3	4
13	Feeling afraid in open spaces or on the streets	0	1	2	3	4
14	Feeling low in energy or slowed down	0	1	2	3	4
16	Hearing voices that other people do not hear	0	1	2	3	4
17	Trembling	0	1	2	3	4
18	Feeling that most people cannot be trusted	0	1	2	3	4
19	Poor appetite	0	1	2	3	4
20	Crying easily	0	1	2	3	4
21	Feeling shy or uneasy with the opposite sex	0	1	2	3	4
22	Feelings of being trapped or caught	0	1	2	3	4
23	Suddenly scared for no reason	0	1	2	3	4
24	Temper outbursts that you could not control	0	1	2	3	4
25	Feeling afraid to go out of your house alone	0	1	2	3	4
26	Blaming yourself for things	0	1	2	3	4
27	Pains in the lower back	0	1	2	3	4
28	Feeling blocked in getting things done	0	1	2	3	4
29	Feeling lonely	0	1	2	3	4
30	Feeling blue	0	1	2	3	4
31	Worrying too much about things	0	1	2	3	4
32	Feeling no interest in things	0	1	2	3	4
33	Feeling fearful	0	1	2	3	4

Example:					
0 = Not at all 1 = A little bit 2 = Moderately 3 = Quite a bit 4 = Extremely					
How much were you distressed by:					
Bodyaches	0	1	2	③	4

How much were you distressed by:

34	Your feelings being easily hurt	0	1	2	3	4
35	Other people being aware of your private thoughts	0	1	2	3	4
36	Feeling others do not understand you or are unsympathetic	0	1	2	3	4
37	Feeling that people are unfriendly or dislike you	0	1	2	3	4
38	Having to do things very slowly to ensure correctness	0	1	2	3	4
39	Heart pounding or racing	0	1	2	3	4
40	Nausea or upset stomach	0	1	2	3	4
41	Feeling inferior to others	0	1	2	3	4
42	Soreness of your muscles	0	1	2	3	4
43	Feeling that you are watched or talked about by others	0	1	2	3	4
44	Trouble falling asleep	0	1	2	3	4
45	Having to check and double-check everything you do	0	1	2	3	4
46	Difficulty making decisions	0	1	2	3	4
47	Feeling afraid to travel on buses, subways or trains	0	1	2	3	4
48	Trouble getting your breath	0	1	2	3	4
49	Hot or cold spells	0	1	2	3	4
50	Having to avoid certain things, places, or activities because they frighten you	0	1	2	3	4
51	Your mind going blank	0	1	2	3	4
52	Numbness or tingling in parts of your body	0	1	2	3	4
53	A lump in your throat	0	1	2	3	4
54	Feeling hopeless about the future	0	1	2	3	4
55	Trouble concentrating	0	1	2	3	4
56	Feeling weak in parts of your body	0	1	2	3	4
57	Feeling tense or keyed up	0	1	2	3	4
58	Heavy feelings in your arms or legs	0	1	2	3	4
60	Overeating	0	1	2	3	4
61	Feeling uneasy when people are watching or talking about you	0	1	2	3	4
62	Having thoughts that are not your own	0	1	2	3	4
64	Awakening in the early morning	0	1	2	3	4
65	Having to repeat the same actions such as touching, counting, or washing	0	1	2	3	4
66	Sleep that is restless or disturbed	0	1	2	3	4
67	Having urges to break or smash things	0	1	2	3	4
68	Having ideas or beliefs that others do not share	0	1	2	3	4
69	Feeling very self-conscious with others	0	1	2	3	4

	Example:							
0 = Not at all	1 = A little bit	2 = Moderately	3 = Quite a bit	4 = Extremely				

How much were you distressed by:

Bodyaches   0   1   2   ③   4

How much were you distressed by:

70	Feeling uneasy in crowds, such as shopping or at a movie	0	1	2	3	4
71	Feeling everything is an effort	0	1	2	3	4
72	Spells or terror or panic	0	1	2	3	4
73	Feeling uncomfortable about eating or drinking in public	0	1	2	3	4
74	Getting into frequent arguments	0	1	2	3	4
75	Feeling nervous when you are alone	0	1	2	3	4
76	Others not giving you proper credit for your achievements	0	1	2	3	4
77	Feeling lonely even when you are with people	0	1	2	3	4
78	Feelings to restless you couldn't sit still	0	1	2	3	4
79	Feelings of worthlessness	0	1	2	3	4
80	The feeling that something bad is going to happen	0	1	2	3	4
81	Shouting or throwing things	0	1	2	3	4
82	Feeling afraid you will faint in public	0	1	2	3	4
83	Feeling that people will take advantage of you	0	1	2	3	4
84	Having thoughts about sex that bother you	0	1	2	3	4
85	The idea that you should be punished for your sins	0	1	2	3	4
86	Thoughts and images of a frightening nature	0	1	2	3	4
87	The idea that something serious is wrong with your body	0	1	2	3	4
88	Never feeling close to another person	0	1	2	3	4
89	Feelings of guilt	0	1	2	3	4
90	The idea that something is wrong with your mind	0	1	2	3	4

Appendix M

Desirability Scale of the Personality Research Form

For the following questions, please choose true if the statement describes you at the present time and false if it does not describe you at the present time.

	True	False
I am quite able to make correct decisions on difficult questions	[ ]	[ ]
I am never able to do things as well as I should	[ ]	[ ]
My life is full of interesting activities	[ ]	[ ]
I believe people tell lies any time it is to their advantage	[ ]	[ ]
If someone gave me too much change, I would point it out	[ ]	[ ]
I get along with people at parties quite well	[ ]	[ ]
I did many very bad things as a child	[ ]	[ ]
I am glad I grew up the way I did	[ ]	[ ]
I often question whether life is worthwhile	[ ]	[ ]
I am always prepared to do what is expected of me	[ ]	[ ]
My daily life includes many activities I dislike	[ ]	[ ]
I am one of the lucky people who could talk with my parents about my problems	[ ]	[ ]
Many things make me feel uneasy	[ ]	[ ]
I am careful to plan for my distant goals	[ ]	[ ]
I find it very difficult to concentrate	[ ]	[ ]
I would be willing to do something a little unfair to get something that was important to me	[ ]	[ ]

Appendix N

Infrequency Scale of the Personality Research Form

For the following questions, please choose true if the statement describes you at the present time and false if it does not describe you at the present time.

	True	False
I have never bought anything in a store	[ ]	[ ]
I could easily count from one to twenty-five	[ ]	[ ]
I can run a mile in less than four minutes	[ ]	[ ]
I have never talked to anyone by telephone	[ ]	[ ]
I usually wear something warm when I go outside on a very cold day	[ ]	[ ]
I have never brushed or cleaned my teeth	[ ]	[ ]
Things with sugar usually taste sweet to me	[ ]	[ ]
Sometimes I see cars near my home	[ ]	[ ]
I have never had any hair on my head	[ ]	[ ]
I have traveled away from my home town	[ ]	[ ]
I have never ridden in an automobile	[ ]	[ ]
I have never felt sad	[ ]	[ ]
I try to get at least some sleep every night	[ ]	[ ]
Sometimes I feel thirsty or hungry	[ ]	[ ]
I have attended school at some time during my life	[ ]	[ ]
I make all my own clothes and shoes	[ ]	[ ]

Appendix O

Treatment Completion Qualitative Items

Please answer the following questions with as much detail as possible.

1. What components of treatment were helpful? Why?

2. What components of treatment were not helpful? Why?

3. If you have been able to control or significantly cut back your Internet gambling behaviours over the course of treatment, how have you been able to do this (i.e., strategies)?

4. If you have not been able to begin to control or significantly cut back your Internet gambling behaviours over the course of treatment, what have been your biggest obstacles?

Appendix P
Information and Consent Form

Study: An Examination of Cognitive Behavioural Group Therapy for Problem Gamblers who Gamble over the Internet: A Controlled Study

Investigators:
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If you
- are 19 years of age or older
- experience problems as a result of your gambling behaviours or have others tell you that you have a gambling problem
- have gambled over the Internet in the previous 12 months
- and would like help overcoming these gambling issues we invite you to participate in our study.

Before agreeing to participate in our study, it is important that you read and understand the following information outlining what this study involves. Once you understand what this study involves you may or may not decide to give informed consent to participate.

Purpose: Problem gambling behaviours can have negative financial, psychological, and social effects on an individual and an individual's family. Over the past two decades, gambling opportunities have grown at an incredible pace. Casinos are no longer only found in major cities, scratch tickets are sold at almost any local store, and VLTs have become common place in bars. In particular, Internet gambling has become a major means of access to gambling for many individuals. It is believed that, due to this increase in availability to gambling opportunities and the widespread acceptance of gambling as a social activity, the prevalence rates of problem gambling has been increasing (Cavion, Wong, & Zangeneh, 2008; Cox, Yu, Afifi, & Ladouceur, 2005). As a result, empirically supported treatments for problem gambling are necessary. However, review articles summarizing the literature in this area show a lack of controlled studies examining the effectiveness of treatments for problem gambling (e.g., Westphal, 2008). Research suggests that individuals who gamble over the Internet are at an increased risk of engaging in problem gambling (e.g., Griffiths & Barns, 2008) and these findings speak to the need for research examining the effectiveness of

treatments for these individuals. Very little research to date has examined the effectiveness of treatments for Internet problem gambling. Past research has shown that Cognitive Behavioural Group Treatment (CBGT) can be effective at treating problem gambling for individuals who gamble primarily at land-based venues (e.g., casino, bars, scratch tickets, etc.); however, research as not yet examined this treatment for individuals who engage in problem gambling behaviours over the Internet.

This study is being conducted to examine the effectiveness of Cognitive Behavioural Group Treatment for problem gamblers who gamble over the Internet.

Procedures: To take part in this study:
- Potential participants must be willing to come into an initial one-on-one session taking place at the Health, Hormones, and Behaviour Laboratory located in the Psychology department at Lakehead University. During this initial session, individuals will be given a number of screening measures to determine if they qualify to participate in this study.
- Those not meeting criteria to participate in the study will be provided with contact information for alternative treatments for problem gambling and other mental health issues.
- Those who meet criteria for the study will receive 12 sessions of group cognitive behavioural therapy for problem gambling.
- All participants will complete a series of pre-treatment measures (which can be done on the Internet or in the laboratory). Following the completion of pre-treatment measures participants will be notified when they will be receiving therapy.
- Participants will also complete a series of measures immediately following the treatment period, 3-months after treatment completion, and 6-months after treatment completion.
- At 3 and 6-month follow-up times, participants will be contacted by e-mail to be reminded to complete the follow-up measures. Participants will be e-mailed a link giving them access to follow-up questionnaires and may complete them at home or come into the laboratory to complete them. Participants will be compensated with a $20 gift card to Tim Horton's for completing the post-treatment and follow-up questionnaire packages.
- It is important for participants to understand that they can withdraw their consent to participate at any time during the study.

Treatment:
- Participants will take part in 12 weekly group sessions, each 90 minutes in length. In addition, brief homework exercises will be assigned following each session. This Cognitive Behavioural Therapy (CBT) program includes four main components: motivational interviewing, behavioural interventions, cognitive interventions, and relapse prevention.
- The therapist will be a PhD student in Clinical Psychology practicing under the supervision of Dr. Dwight Mazmanian. This student has taken several advanced courses in Psychotherapy including courses in CBT and group therapy and has experience as a group therapist working with individuals suffering from addictions.

Duration of study and number of visits:

- Initially, all potential participants are required to come into the Health, Hormones, and Behavioural Laboratory at Lakehead University for an initial screening session lasting about 45-60 minutes. This session is done to determine if each participant meets criteria to participate in the study.
- Those participants meeting criteria to participate in the study will then be required to complete a series of measures lasting about 20 minutes which can be completed either online at home or in the laboratory depending on the participant's preference.
- Participants will undergo 12 weekly group sessions, each lasting 90 minutes in length. Participants will also be expected to complete brief homework exercises each week. In addition, participants will also complete a series of measures immediately following the treatment period, 3-months after treatment completion, and 6-months after treatment completion. Each of these series of measures will take approximately 5-10 minutes to complete and can be completed either online at home or in the laboratory depending on the participant's preference.

Risks: There is no reason to believe that any adverse events will result for participants taking part in this study.

Benefits: Participating in this study has several potential benefits. Problem gambling behaviours often lead to several negative consequences and research suggests that this treatment can help individuals overcome their gambling problem. As a result, participants in this study have the opportunity to engage in a treatment that can help them better understand and overcome their negative gambling behaviours.

Confidentially: If you agree to participate in this study, the researchers will be the only individuals that will have direct access to the information you provide us, and they will be required to uphold confidentiality. The information that is collected from this study will be kept in a locked, secure place for five years following the completion of the study, at which time the information will be destroyed. In addition, during therapy sessions, participants may disclose personal information to the group. Each participant is expected to respect the privacy of other participants by not disclosing any personal information about another participant to individuals outside of the group.

Participation: It is important that you understand that your participation in this study is completely voluntary. If you do decide to participate, you may decide at any time during the study that you want to leave the study. Furthermore, at any point during the study you may decide to refuse to answer any question that you would prefer not to answer.

Compensation: All participants will receive treatment for their gambling problem. Furthermore, participants will be compensated with a $20 Tim Horton's gift certificate for completing the post-treatment, 3-month post-treatment and 6-month post-treatment measurement packages.

Expenses associated with participating in the study: All participants will be provided with free parking at Lakehead University when attending any sessions pertaining to the study.

Questions: We have tried to provide extensive information regarding what this study entails. If you have any further questions or concerns regarding this study, please do not hesitate to contact us.

<u>Consent</u>

I _____ (please print), have read the information letter provided and have been told how to get more information about this study. My signature on this page indicates that I understand the information provided and agree to participate in this research.

_____   _____

Participant Signature   Date