

Psychosocial Factors Related to Gambling Abstinence and Relapse in Members of Gamblers Anonymous

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Abstract Problem gamblers account for almost one-third of the industry's total revenue with the adverse effects of problem gambling including significant financial loss, legal and occupational difficulties, family problems, psychological distress and suicide. As such, it is important to understand the influential factors in gambling abstinence and relapse, which will assist in the development of relapse prevention methods in therapeutic treatment regimes. This paper reported the role of a set of seven predictors in distinguishing between abstinent and relapsed gamblers among 75 Gambling Anonymous (GA) members (55 males; 20 females; Mean age 45 years) in Southeast Queensland. The measures taken were meeting Attendance and Participation, Social Support, God Belief, Belief in a Higher Power, Working the 12-steps of Recovery, Gambling Urges and Erroneous Cognitions. Discriminant analysis revealed that the variables separating the two groups were significant, suggesting that GA members achieving abstinence could be distinguished from those who relapsed, with Attendance and Participation, and Social Support contributing the greatest influence on member's ability to abstain from gambling. The findings suggested that GA member's involvement in meetings, and support from family and friends had significant impact on their gambling abstinence. In contrast, increased gambling urges and erroneous cognitions increased the chance of relapse.

Keywords Pathological gambling · Gamblers Anonymous · Abstinence · Relapse · Gambling urges · Erroneous cognitions

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Introduction

Australians lost \$14 billion through gambling related activity in 2000–01 with problem gamblers accounting for almost one-third of the industry's total revenue (Banks, 2002). The personal and social effects of problem gambling often include significant financial losses, family problems, legal and employment difficulties, psychological distress and suicide. Treatments for pathological gambling most often include psychodynamic therapy, aversion therapy, behavioural therapy, cognitive therapy, cognitive-behavioural therapy, multimodal approaches and pharmacotherapy (Raylu & Oei, 2002; Viets & Miller, 1997; Viets, 1998). However, a less formal, but commonly recognised treatment for problem gambling is Gamblers Anonymous (GA), which is a mutual aid fellowship based on the 12-steps program first developed for Alcoholics Anonymous (AA) (Ferentzy & Skinner, 2003). GA Australia concede that the purposes of GA are; To grow spiritually through living by the 12 steps of GA; To learn to live with the gambling problem; To give encouragement and understanding to the compulsive gambler and; To welcome and give assistance and comfort to the families of compulsive gamblers. However, since its conception, argument over the usefulness of GA has arisen due to the small percentage of gamblers who relapse after trying the program (Lesieur & Blume, 1987; Petry, 2002).

The principal criterion for success in GA is total abstinence from gambling (Gamblers Anonymous, 1984; McCown & Chamberlain, 2000). However, there is no consensus in the literature as to the necessity or benefit of abstinence in the treatment of problem gambling (Ferentzy & Skinner, 2003). McCown and Chamberlain (2000) argue that abstinence is the preferable goal of treatment because, rather than gambling, clients learn new coping, personal and social skills. Conversely, others have been unequivocally critical of the abstinence principle and suggest that self-restraint should not be considered the only indicator of success (Blaszczynski, McConaghy, & Frankonova, 1991; Peele, 2001; Rosecrance, 1988). Recent studies suggest that a significant majority of compulsive gamblers relapse at least once while attempting to quit gambling (Thygesen & Hodgins, 2003). For example, in a study of recovering problem gamblers, Hodgins and el-Guebaly (2004) found that 92% of those followed up at 12 months had relapsed in the period. Similarly, Walker (1993) found that 71% of treated gamblers relapsed within 1 year of stopping their gambling, and after 2 years only 15% were still abstinent. However, GA appears tolerant to relapse and it is often recognised within the rehabilitation process (McCown & Chamberlain, 2000). Nonetheless, this tolerance fails to recognise the influence of external factors that may be responsible for gambling relapse.

Various external factors that have been associated with the precipitation of gambling relapse encompass various psychological, biological and environmental risk factors (Connors, Maisto, & Donovan, 1996; Ledgerwood & Petry, 2006; Raylu & Oei, 2002). Such factors include poor coping abilities (McCormick, 1994), cognitive distortions (Coventry & Norman, 1998; Oei & Raylu, 2007; Raylu & Oei, 2004a, b), personality constructs (Coventry & Brown, 1993), genetic predispositions (Lobo & Kennedy, 2006) and social/situational cues in the gamblers environment (Ledgerwood & Petry, 2006). However it is also suggested that these factors may interact to reactivate gambling behaviour. For example, social/situational cues in high risk situations (e.g. in a casino) may precede biological responses (e.g. increased heart rate), which may result in gambling urges or cognitions (Ledgerwood & Petry, 2006). The gambler's self-efficacy and ability to resist gambling, may then depend on internal factors such as personality, coping ability, biological constructs and cognitions (Connors et al., 1996; Ledgerwood & Petry, 2006). As

such, the current study will assess a number of these factors, in addition to further variables explicit to the GA fellowship, which it is argued should be the main focus of such a treatment.

The terms ‘problem gambling,’ ‘compulsive gambling’ and ‘pathological gambling’ are often used to describe a disorder that is characterised by a loss of control over gambling, deception about the extent of one’s involvement with gambling, family and job disruption, theft, chasing losses and the effort to win back money lost while gambling. The term ‘pathological’ generally refers to those gamblers whose behaviour meets the definition of persistent, recurrent maladaptive gambling behaviour, and five of the ten diagnostic criteria outlined in the DSM-IV (American Psychiatric Association, 1994), whereas the term ‘problem’ can refer to those gamblers that meet the criteria, but also those that are experiencing less severe gambling problems (Raylu & Oei, 2002, 2004a, b). The term ‘compulsive’ however is most often used by laypersons such as GA members, and meets the pathological gambling criteria referred to above (Raylu & Oei, 2002). These terms will be used interchangeably throughout this paper.

Gamblers Anonymous 12-step Program

The 12-step program requires the gambler to firstly admit their powerlessness over gambling, and to acknowledge that their lives had become unmanageable. Second, members are required to believe that a Power (or God, of their own understanding) greater than themselves could restore them to a normal way of thinking and living, and that a decision be made to turn their will and lives over to the care of this Power. This is followed by the decision to make a searching and fearless moral and financial inventory of themselves; admit to themselves and others the exact nature of their wrongs, and that they are entirely ready to have these defects of character removed, asking their Power to remove their shortcomings. This is then followed by the gambler making a list of all persons whom they had harmed, and to become willing to make amends to them all (except when to do so would injure them or others). Members are also required to continue taking personal inventory and when they considered themselves to be wrong, to promptly admit to it. Finally, after fulfilling the initial 11 steps, gamblers are requested to carry this message to other compulsive gamblers (gamblersanonymous.org.au).

Opposing arguments as to the effectiveness of the 12-step program within GA exist whereby supporters maintain that the phases strengthen members’ resolve to abstain from gambling (Walker, 1993), whereas in a comprehensive critical review of GA, Ferentzy and Skinner (2003) argue that conclusions as to the efficacy of the GA recovery program cannot be drawn and must remain tentative. Assessing the treatment outcome of four outpatient gambling programs (with an emphasis on the 12-steps program), Stinchfield and Winters (2001) revealed that 28% of compulsive gamblers had abstained from gambling 6-month post-treatment, and 20% had gambled less than once in the previous month. Overall, 48% showed clinically significant improvement (e.g. amount of money gambled, number of friends who gamble, psychosocial and financial problems) at 6-month follow up. It should be noted however that the attrition rate in this study was very high (27%), and all four of the treatments included cognitive-behavioural therapies and other treatments in combination with the 12-steps program. As such, this combination of therapies makes determining the efficacy of the 12-steps program alone difficult, given that problem gamblers ability to think, reason, and make decisions are often subjected to many forms of error and cognitive distortions (Delfabbro, 2004; Toneatto, Blitz-Miller, Calderwood,

Dragonetti, & Tsanos, 1997). To eliminate the influence of other therapies, the current paper will include only those individuals undergoing the GA 12-step program.

Higher Power and God Belief

Diaz (2000) and Lam (2006) have revealed that the frequency an individual gambles is influenced by how often they participate in religious services. However, whereas Lam (2006) did not find a significant relationship between the importance of faith and the frequency of gambling, Diaz (2000) revealed a strong inverse relationship between these variables, but the level of importance of religion did not significantly influence the amount of money gambled. These findings suggest that some link between religious belief and gambling behaviour exists, which may partition gambling abstiners from those who relapse.

The 12-steps used in the GA program are described as the articulation of a set of spiritual beliefs and directives (Tonigan, Toscova, & Connors, 1999). These beliefs include the acceptance of a transcendental being or a 'Higher Power.' Although some of the steps do not specify the exact nature of the 'Higher Power,' this can be perceived in any way a member wishes, such as God, or the psychological and emotional support from the group. GA literature indicates that what is considered essential is the understanding by compulsive gamblers that they need help from a power greater than themselves (Gamblers Anonymous, 1984). However, research by Mankowski, Humphreys, and Moos (2001) argues that an individual's spiritual or religious beliefs may correspond to key principles in 12-step programs and may therefore predict greater involvement because they find them familiar, comfortable and consistent with their own worldview.

Meeting Attendance and Participation

Research has found that GA meeting attendance is often associated with increased abstinence from gambling (Petry, 2003; Petry & Mallya, 2004; Russo, Taber, McCormick, & Ramirez, 1984; Taber, McCormick, Russo, Adkins, & Ramirez, 1987) yet none of these studies have considered the influence of other factors that may contribute to the reduction in gambling behaviour. In comparison however, similar research into AA has suggested that the composite measure of attendance, perceived importance to recovery, degree of involvement in AA activities, and number of friends who were active in AA, contributed to more behavioural change processes, including abstinence, than did mere frequency of meeting attendance (Snow, Prochaska, & Rossi, 1994). Further, in a meta-analytic review of AA, Emrick, Tonigan, Montgomery, and Little (1993) found that many mediating processes were ignored if alcohol dose was equated only with attendance. It is therefore argued that these findings would also generalise to a GA population, and as such the current study will consider the impact of meeting attendance and participation in members of GA. Further, it has been suggested that given the underlying principles of fellowship and sponsorship of such 12-step programs, social support may mediate the effect of meeting attendance and gambling relapse (Ledgerwood & Petry, 2006) therefore the current study will consider this factor in addition.

Social Support

A lack of perceived family and peer support has shown to be a risk factor for the development of gambling related problems and abstinence from gambling (Hardoon, Gupta, &

Derevensky, 2004; Rugle & Rosenthal, 1994; Stein, 1993). It is suggested that the availability of physical and emotional support may protect individuals from negative physical and psychological consequences (Sherbourne & Stewart, 1991). Furthermore, Stein (1993) argues that gamblers who withdraw themselves, and fail to discuss their thoughts and emotions with others are at increased risk of gambling relapse. Nonetheless, minimal research has been conducted into the relationship between social support from other gamblers in GA and abstinence from gambling. However, related research in AA has shown that social support from other members consistently contributed to abstinence 3 years following a treatment episode (Bond, Kaskutas, & Weisner, 2003). It has also been found that alcohol specific support appeared to be more important in maintaining abstinence than other more general social support (Beattie & Longabaugh, 1999). These findings suggest that social support may have important implications for the reduction of problematic behaviours in compulsive gamblers.

Erroneous Cognitions and Gambling Urges

Gambling research has consistently shown that erroneous cognitions play a role in the development and maintenance of gambling behaviours (Coulombe, Ladouceur, Desharnais, & Jobin, 1992; Griffiths, 1994; Ladouceur, Gaboury, Dumont, & Rochette, 1988; Raylu & Oei, 2004a; Walker, 1993). For example, in studies where problem gamblers verbalised their thoughts, over 70% of their statements were found to be irrational (Coventry & Norman, 1998; Delfabbro & Winefield, 2000; Dixon & Schreiber, 2004; Gaboury & Ladouceur, 1989). Common biases or errors include the illusion of control whereby the gambler believes that they can control gambling outcomes (Coventry & Norman, 1998; Delfabbro & Winefield, 2000; Dixon & Schreiber, 2004; Gaboury & Ladouceur, 1989; Ladouceur et al., 1988; Langer, 1975; Walker, 1992), and the availability heuristic in which the recollection of wins is more easily remembered than previous losses (Raylu & Oei, 2004a). Additionally, the gambler's fallacy often held by compulsive gamblers stems from an expectation that a win will follow after a long sequence of losses, despite the gambling events being random and thus unpredictable (Delfabbro, 2004). Finally, problem gamblers frequently possess biased attributions in which they credit successful outcomes to internal factors such as skill, and losses to external factors such as casino noise or lighting (Gilovich, 1983).

Gambling urges on the other hand can be defined as a psychological, physiological, or emotional motivational state that involves a need, want, or desire to gamble (Sharpe, 2002). These urges are often associated with gambling lapses and are considered important factors in the maintenance of problem gambling (O'Connor & Dickerson, 2003; Sharpe, 2002). However, whereas internal triggers such as emotional states, personality traits and psychological vulnerability can precipitate a compulsion to gamble, external triggers such as gambling cues, previous wins or losses, and earlier gambling experience can influence such urges (Raylu & Oei, 2002, 2004a, b). Whereas it has been shown that erroneous cognitions and gambling urges are highly correlated with problem gambling (Petry, 2003, 2005), minimal research to date has focused specifically on these factors within a GA population.

The Current Study

The first objective of the current study is to discriminate between those members who abstain from gambling, and those who relapse within a 12-month period, using gambling

cognitions, social support and specific GA variables. Specifically, the study will explore the contribution of GA Attendance and Participation, Working the 12-steps to Recovery, Social Support, and Erroneous Cognitions and Gambling Urges between abstinent and relapsed members of GA. Furthermore, given that a spiritual belief is a key principle in the GA 12-step program, Higher Power, and God Belief are included to examine and statistically control for potentially important sources of variability in those attending GA meetings. Second, the paper will aim to determine those factors that are considered most important in predicting group membership. Given that minimal research has considered the importance of these factors collectively, and that many of the GA fellowship variables have not been examined explicitly in previous literature, this deems the nature of the current study exploratory in nature. This study is important in that knowledge of the influential factors in gambling abstinence and relapse will assist in the development of relapse prevention methods in GA and therapeutic treatment regimes.

It is hypothesised that these factors will discriminate between the abstinent and relapse groups of GA members. It is also hypothesised that each of the predictor variables will significantly contribute to the discriminant function that distinguishes between the groups. Specifically, it is predicted that the abstinent group will have higher scores in the GA Attendance and Participation, Social Support, God belief, Belief in a Higher Power, and Working the 12-steps of Recovery, and lower scores in Gambling Urges and Erroneous Cognitions, compared to the relapse group.

Methods

Participants

The nature of GA meetings precludes that no membership lists are kept or attendance rolls taken. This anonymity is fundamental to an environment of safety and confidentiality of GA members. As such, it remains difficult to provide an estimate of GA members, or determine how representative the current participants are of GA members in Australia. As an indication however, there exists ~670 registered users on the GA Australian website forum. Seventy-five participants were recruited from members of the GA fellowship in southeast Queensland. The sample comprised 55 males and 20 females ($N = 75$). The participants ranged in age from 21 to 64 (M 45 years and SD 10 years). Participants were required to have met initial criteria of at least 12-month GA attendance prior to completion of the questionnaire.

Measures

The South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987)

The South Oaks gambling screen (SOGS) is a 20-items self-report questionnaire that assesses lifetime gambling related difficulties. This measure was used to confirm that the participants met pathological gambling criteria at the time of establishing membership of GA. A score of five or greater indicates probable pathological gambling as validated against clinician ratings (Lesieur & Blume, 1987; Stinchfield, 2002). The SOGS has shown to have high validity by cross-tabulating patients' scores with counsellor's independent

assessment scoring ($r = 0.086$ and $p < 0.001$), and high internal consistency with a Cronbach's alpha of 0.97 (Lesieur & Blume, 1987).

The MOS Social Support Survey (MOS; Sherbourne & Stewart, 1991)

The MOS Social Support Survey is a 19-items measure of perceived social support across multiple dimensions: Emotional/Informational, Tangible, Affectionate and Positive Social Interaction. Respondents are presented with items such as 'Someone to give you good advice about a crisis' and 'Someone who hugs you,' and are asked how often the particular kind of support is available. Responses are recorded on a five-point Likert-scale (1 = none of the time to 5 = all of the time). Scores are summed and averaged, with higher scores indicating increased levels of perceived social support. Internal consistency for the overall scale was high ($\alpha = 0.97$). Factor analyses supported the construction of an overall index combining the 19 items (Sherbourne & Stewart, 1991).

The Gambling Urge Scale (GUS; Raylu & Oei, 2004b)

The gambling urge scale (GUS) is a six-items questionnaire designed to measure gambling urges. Respondents are presented with such items as 'All I want to do now is gamble,' and 'I want to gamble so bad I can almost feel it,' and asked to indicate how much they agree or disagree with the six statements at the time they are completing the questionnaire. Participants respond using a seven-point Likert-scale (0 = strongly disagree to 6 = strongly agree), with higher overall scores indicating a greater urge to gamble. Internal consistency for the overall scale was good with a Chronbach's alpha of 0.81 (Raylu & Oei, 2004b). Results in Raylu and Oei (2004b) suggested that concurrent, predictive and criterion-related validity of the GUS were adequate.

The Gambling Related Cognitions Scale (GRCS; Raylu & Oei, 2004a)

The gambling related cognitions scale (GRCS) is a 23-items questionnaire designed to measure erroneous gambling related cognitions. Respondents are presented with items such as, 'I can't function without gambling,' 'I collect specific objects that help increase my chances of winning,' and 'I have some control over predicting my gambling wins,' and are asked to rate their level of agreement with each statement on a seven-point Likert-scale (1 = strongly agree to 7 = strongly disagree). Higher overall scores indicate an increased number of cognitive distortions held by the individual. The GRCS shows high internal consistency ($\alpha = 0.93$) and concurrent, predictive, and discriminant validity has shown to be satisfactory (Raylu & Oei, 2004a).

Alcoholics Anonymous Involvement Scale-Modified Version (AAI; Tonigan, Connors, & Miller, 1996)

The AAI is a 13-items self-report measure of attendance and involvement in AA, which was modified for use by GA members to reflect the programs practices more accurately. For example, a question in the AAI relating to 90 meetings in 90 days was deleted, as this practice is not suggested in the GA literature. The final questionnaire comprised 15 questions to be answered on a Yes/No basis (Yes = 1 and No = 0). Higher scores indicated a greater attendance and participation in GA meetings. Psychometric data has not been reported for the modified version of the AAI, however good internal item consistency has

been found for the total AAI scale ($\alpha = 0.85$), with each of the 11 items correlated with the total scale score at or above 0.30 (Tonigan et al., 1996).

Religious Background and Behaviour Questionnaire (RBB; Connors, Tonigan, & Miller, 1996)

The religious background and behaviour questionnaire (RBB) is a 13-items questionnaire that measures an individual's current religious affiliation and behaviour. The first item determines the participant's religious belief (e.g. Atheist, Agnostic, Unsure, Spiritual and Religious), whereas the following six items measure the participant's frequency with which they had engaged in religious behaviours in the past year (e.g. thought about God, prayed, attended worship services, read/studied scriptures/holy writings and had direct experiences of God). Participants respond on an eight-point Likert-scale (1 = never to 8 = once a day or more), with higher scores indicating a greater participation in religious behaviours. The final six items measure these same domains on a lifetime basis, but as the lifetime behaviours were not of interest in the current study they were deleted from the questionnaire to reduce complexity. For the purposes of the present study, the scale was scored on the first three items of the RBB (God Consciousness sub-scale) such that a score from 0 to 4 was assigned to the first item (atheist = 0, agnostic = 1, unsure = 2, spiritual = 3 and religious = 4). The remaining items were recoded before calculating scores to give the scale a floor score of zero. The Cronbach's alpha for the God Consciousness sub-scale was reported at 0.76 (Connors et al., 1996).

Higher Power Measure

This measure was developed specifically for the purpose of the current study. Participants were asked to select one of eight items which best describes their belief in relation to a 'Higher Power.' Participants were given options such as 'I don't believe that there is such a thing as a Higher Power,' 'God is my Higher Power,' 'The GA Fellowship is my Higher Power' and 'My Higher Power is (*Please specify*).' The choices were coded as a dichotomous variable such that 0 = No Higher Power and 1 = Have Higher Power.

Working the 12-Steps Measure

This measure was created specifically for the current study to measure the frequency that participants worked each step in the GA 12-steps to Recovery program. Participants responded on a seven-point Likert-type scale (1 = strongly disagree to 7 = strongly agree) to the statement 'I work this step often.' Total scores range from 12 to 84, with higher scores indicating a greater adherence to the 12 steps.

Procedure

The study was cleared in accordance with the ethical review process of the University of Queensland and within the guidelines of the National Health and Medical Research Council (NHMRC) prior to data collection. Additionally, permission from GA was obtained to attend their meetings for the purposes of the study. Subsequently, an information sheet and consent form was sent to members of GA in southeast Queensland. The information sheet outlined the purpose of the research, assured the participant's confidentiality

and informed participants of their right to withdraw should they decide to participate. The researcher attended 12 GA meetings in Brisbane and the Gold Coast over a period from 28 June 2004 to 21 July 2004. Participants were instructed to complete the questionnaires at the meeting. About 15% of the questionnaires were completed outside the meeting and returned to the researcher by mail.

Results

All participants were confirmed as compulsive gamblers with a mean SOGS score of 14.75 (SD 3.37; range 6–20), and in accordance with GA samples (Petry, 2003; Stinchfield, 2002). Overall, 95 questionnaires were completed. Missing values were minimal (<5%) therefore in cases where a participant had failed to complete a response, values were replaced with score means. This method of mean substitution was expected to yield the closest approximation to each individual's missing value for that measure. Two participants were excluded from the analysis due to a failure to complete the bulk of the questionnaire. The data from the remaining 93 questionnaires were examined to establish whether they met the initial criteria of at least 12-month GA attendance prior to completion of the questionnaire. As a result of this examination, a further 18 participants were excluded from the study. Forty-four (58.7%) participants were classified as abstinent (i.e. gamble free for at least 12 months prior to completing the questionnaire) and 31 (41.3%) were categorised in the relapse group (i.e. have gambled in the 12 months prior to completing the questionnaire). An ANOVA examining the difference between groups in relation to SOGS scores found no significant difference, $F(1, 73) = 3.70$ and $p > 0.05$.

A discriminant analysis was performed to investigate whether GA Attendance and Participation, Social Support, God and Higher Power Belief, 12-step score, Gambling Urges, and Erroneous cognitions could discriminate between the abstinent group and the relapse group. Mean, SD, number of items in each scale and internal consistency reliability coefficients (Cronbach's alpha) for these measures are presented in Table 1. To correct for family wise error rate, Bonferroni adjustments were used so that each analysis was evaluated at $p = 0.01$.

The discriminant function using the predictors indicated previously was significant ($\lambda = 0.476$, $\chi^2 = 51.56$ and $p < 0.001$). The canonical correlation coefficient for the function was 0.72 with the between group variability accounting for 51.8% of the discriminant function. Wilks' Lambda and Univariate F ratios were significant for all predictor variables (see Table 2). As shown in Fig. 1, the abstinent group had higher mean

Table 1 Mean, SD, item numbers, Cronbach's alpha for continuous predictor variables

Variables	Mean	SD	Number of items	Cronbach's alpha
GA attendance and participation	9.17	3.49	15	0.82
Social support	3.55	1.04	19	0.97
Religious background	11.12	5.66	3	0.83
Higher power	0.81	0.39	2	–
12-step	61.80	17.36	12	0.96
Gambling urges	2.32	5.07	6	0.93
Gambling cognitions	46.76	27.78	23	0.95

Table 2 Univariate *F* ratios and Wilks' Lambda for predictor variables

Variables	Wilks' Lambda	<i>F</i> (1, 73)
GA attendance and participation	0.654	38.63***
Social support	0.674	35.27***
Gambling urges	0.771	21.73***
Working the steps	0.810	17.09***
Belief in higher power	0.814	16.73**
Erroneous cognitions	0.856	12.29**
God belief	0.947	4.07*

* *p* < 0.05

** *p* < 0.01

*** *p* < 0.001

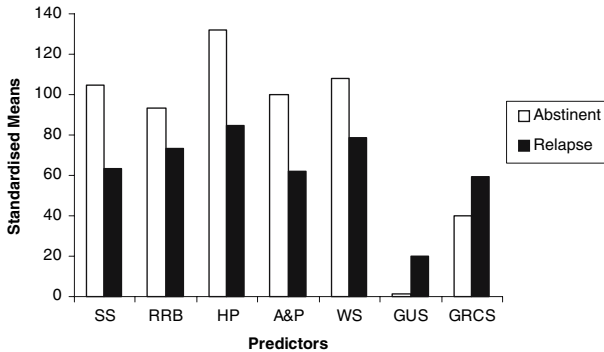


Fig. 1 Standardised mean scores on each predictor for each of the abstinent and relapse groups. *SS* social support, *RRB* god belief, *HP* higher power, *A&P* attendance and participation, *WS* working the steps, *GUS* gambling urges, *GRCS* erroneous cognitions

scores for GA Attendance and Participation, Social Support, God Belief and Belief in a Higher Power, and Working the Steps, compared to the relapse group, whereas the relapse group had higher Gambling Urges and Erroneous Cognitions scores. As indicated in Table 2, all these differences were statistically significant.

Correlations between each variable and the discriminant function revealed that Attendance and Participation (*r* = 0.73), and Social Support (*r* = 0.70) were the most important factors in predicting group membership, followed by Gambling Urges (*r* = −0.55). The 12-steps to Recovery (*r* = 0.49), and Erroneous Cognitions (*r* = −0.41) provided moderate prediction ability, whereas Belief in a Higher Power (*r* = 0.35) and God Belief (*r* = 0.23) were the least important. The overall accuracy in predicting group membership was 86.7%, which was much higher than prediction by chance alone (51.6%). The discriminant function showed good classification accuracy with high sensitivity (0.95), moderately high specificity (0.74), low false positive (0.16) and low false negative (0.08).

Discussion

The present study examined the role of a set of predictors in distinguishing between abstinent and relapsed groups of compulsive gamblers. It was hypothesised that GA Attendance and Participation, Social Support, God Belief, Belief in a Higher Power, Working the 12-steps to Recovery, Gambling Urges, and Erroneous Cognitions would discriminate between abstinent and relapse groups of GA members. This hypothesis was supported and all the variables significantly contributed to the discriminant function separating the groups.

Results revealed that Attendance and Participation, and Social Support were important variables in distinguishing between abstinent and relapse groups. Similarly, Social Support was associated with longer abstinence phases in the problem gamblers in this study. Whereas attendance and participation at meetings has not been previously studied in compulsive gambling populations, research with alcoholic samples suggests that these factors are important in maintaining behavioural change (Tonigan et al., 1996). These findings suggest that treatment for pathological gambling would benefit by including the identification of a support network, and the involvement of that network in the gamblers recovery process.

Adherence to the 12-steps to Recovery program adopted by GA provided a moderate, but significant influence in distinguishing between abstinent and relapsed groups. That is, despite debate as to the merit of the GA program (Ferentzy & Skinner, 2003), these findings suggest that adherence to the steps is important in the recovery process. However, given that the 12-step program does not provide specific techniques to complete each phase, and will be subject to individual differences in the practice of these steps, future research needs to determine which elements of the program distinguish between success and failure.

Gambling anonymous literature strongly supports the proposition that it is not necessary to believe in God to belong to the GA fellowship (Gamblers Anonymous, 1984). However, it is generally accepted that the belief in a power external to and greater than oneself is required to work the GA program and maintain abstinence (Gamblers Anonymous, 1984; Walsh, 2002). As such, it is somewhat surprising that the God Belief and Belief in a Higher Power variable (although significant) did not prove to be more important in the analysis, especially given the finding that individuals with already established religious or spiritual beliefs are more likely to participate in programs consistent with their own world view (Mankowski et al., 2001). These results can be explained however by Diaz (2000) and Lam (2006) who found that the importance of faith did not appear to influence various gambling behaviours.

Significant differences existed between the abstinent and relapse groups in their Erroneous Cognitions and Gambling Urges, such that members who relapsed had higher scores on these two factors. It is particularly interesting to note that erroneous cognitions found in general population studies (Raylu & Oei, 2004a) corresponded to erroneous cognitions in the relapse group (but significantly less in the abstinent group) in this study. This finding may be of importance given that the GA program does not specifically offer education or therapy to correct erroneous cognitions or gambling urges, and raises question about which constituents of the GA program relieves abstinent members of their maladaptive thought patterns and gambling compulsion.

It should be noted however that we cannot infer causality from the current findings. Specifically, it is reasonable to suggest that many of these factors may be a consequence of

abstinence, rather than the cause. For example, it could be argued that abstaining from gambling may lead to better attendance and participation in meetings, improved social support, and fewer gambling cognitions, rather than vice versa.

Strengths and Limitations

Many studies in the gambling literature measure abstinence in terms of the time interval since last bet (Walsh, 2002; Petry, 2003; Stein, 1993) and correlate this with various predictors of abstinence. Such a conceptualisation of abstinence can result in a distorted view of the predictor's effects. For example, the period of abstinence measured by Stein (1993) ranged from 1 week to 29 years (mean 4 years and median 2 years). It is suggested that such data (unless transformed and/or with outliers removed) is uninterpretable. To overcome this problem in the current study, abstinence was operationalised as 12 months devoid of gambling, prior to the completion of the questionnaire. The 12-month period was considered reflective of the time needed for an individual to adequately progress through the 12-step program, and allows for any relapses that may occur subsequent to joining GA. Second, most members completed and returned the questionnaires during a meeting attended by the researcher. This method of data collection eliminated the problems associated with low return rates for questionnaire designs, and high attrition rates, which are common in longitudinal designs.

The current study also suffered from some limitations, which must be noted. For example, the population to which these results can be generalised is a small population, and can only be presumed reflective of people who have been in a GA at least a year, and who regularly attend, and who are willing to participate in a study. Furthermore, given that the study was not a direct comparison of programs or treatments, it did not include a no-treatment control group. As such, direct inferences cannot be made as to the influence of the GA program, or the outcome of those gamblers who did not receive treatment. Finally, the study relied on a self-report questionnaire for its data, which may impact on the validity of the findings. However, the effect of this limitation is minimised given that the data generally related to present events rather than the recall of retrospective events. Similarly, to facilitate the accuracy of self-report, no names were recorded on the questionnaires thus ensuring the member's anonymity. Finally, whereas the SOGS, GUS, GCRS and MOS Social Support Survey are all measures with proven psychometric properties in gambling research, the measures of Belief in a Higher Power, and working the 12-steps Measure were created specifically for this study, and therefore are not psychometrically established. However, the Higher Power questionnaire is a categorical measure requiring the participants to acknowledge their belief or otherwise in an external power, and is therefore easily understood and answerable by the participants, and assessment of the 12-steps Questionnaire revealed that the measures internal reliability was high (Conbach's $\alpha = 0.96$).

Although abstinence and reduced gambling are the outcome measures usually considered in compulsive gambling research, a large proportion of GA members occasionally relapse. Nevertheless, they continue their involvement in GA and gain periods of abstinence that can improve their lives. Accordingly, it is suggested that future research should consider, as an outcome measure, the extent of subjective well being that members in GA experience. The results of this study demonstrate that gambling abstinence within GA is related to an integrated model of spiritual, social and psychological constructs. It is important for professional therapists, and members of GA to consider factors that

contribute to maintaining abstinence, and recognise that failure to embrace them may lead to relapse.

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