Responsible gambling: a synthesis of the empirical evidence

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ABSTRACT
Many jurisdictions around the world have implemented Responsible Gambling (RG) programs for the purpose of preventing gambling-related harms. Using a research synthesis strategy, this paper examines the extant peer-reviewed empirical evidence underpinning RG strategies. Instead of reporting all available studies and then discarding many on the ground of methodological flaws, we used the following a priori set of inclusion criteria: (1) All studies must have been conducted within real gambling environments with ‘real’ gamblers; and studies must have included at least one of the following elements: (2) a matched control or comparison group; (3) repeated measures; and (4) one or more measurement scales. The results revealed that only 29 articles met at least one of the methodological criteria. These empirical studies revealed five primary RG strategies. These findings have practical implications for evidence-based implementation of RG activities.

Governments and industry operators have implemented responsible gambling (RG) initiatives and programs to prevent or minimize gambling-related harms. These RG initiatives and programs are designed to reduce the prevalence and incidence of gambling-related harms by assisting gamblers to maintain their gambling expenditure within affordable limits. Existing RG programs include, but are not limited to, a variety of strategies: self-exclusion programs; behavioral tracking of play patterns; loss and deposit limit setting (both player and corporate); player pre-commitment to deposits, losses, wins, or gambling time; warning messages; restricted game design; gambling education and information; and support services reflecting primary, secondary and tertiary prevention efforts. Unfortunately, the scientific evidence supporting many of these programs and initiatives is absent or weak.

The Reno Model (Blaszczynski et al. 2004) proposed the first strategic framework describing the fundamental principles necessary to guide the development of RG strategies as well as the responsibilities of industry operators, health service and other welfare providers, interested community groups, consumers, and governments and their related agencies. The Reno Model framework lays out a guide to the process of RG program adoption, implementation, and evaluation of empirically supported initiatives and strategies. Given the public policy and legislative demands (e.g. ‘Bill H03697’, 2011) requiring the implementation of these activities, there is a need to determine the efficacy of RG strategies. Unfortunately, regardless of the limited empirical evidence supporting the effectiveness of these programs (Williams et al. 2012), many presumptively effective RG activities continue to be implemented (Blaszczynski et al. 2004). In addition, where existing evidence does exist, inadequate methods, study samples, and design flaws often compromise the value of this research. Given the potential public health impact of RG programs, it is vital to evaluate the extant body of scientific evidence – instead of opinion-based arguments – to identify the strategies and activities that can guide the development and implementation of effective RG programs. The need for identifying this body of evidence has never been more necessary. As gambling has expanded around the world, jurisdictions are requiring RG programs and activities – without knowing which activities are safe and effective. In Massachusetts, for example, pre-commitment (i.e. a RG strategy where players set limits on expenditure at commencement of a session) is required despite the fact that there is little empirical evidence to support this strategy. Further complicating this matter, little research has been conducted with actual gamblers and gambling; instead researchers often employ laboratory settings and simulated gambling with college students who are not representative of the community in general or gamblers in particular (Shaffer et al. 2010, 2011; Gainsbury et al. 2014).

RG activities often include an educational component. Williams et al. (2012) conducted a literature review evaluating the effectiveness of various educational initiatives, policies, and purported ‘best practice’ interventions for preventing problem gambling. These authors concluded that...
the estimated effectiveness of educational initiatives (i.e. type of RG initiative) is moderate with research data showing that prevention programs for children are generally effective in reducing misconceptions and increasing knowledge about gambling. However, the absence of long-term follow-up and behavioral measures makes it difficult to draw any conclusive statements about the effectiveness of these programs (Blaszczynski et al. 2004). In general, various risk reduction strategies, for example, information and awareness campaigns, on-site information/counseling centers, and statistical instruction have moderately low effectiveness (e.g. Tobler 1986; Ennett et al. 1994; Johnson et al. 2003; Hertwig et al. 2004; Fortune & Goodie 2012).

Alternatively, the efficacy of restricting availability and access to gambling as a method of reducing harm is moderately high. Although it appears that some gambling-related harm prevention programs are more effective than others, the most commonly adopted ones tend to be the least effective (Williams et al. 2012).

The purpose of this research is to identify empirically grounded RG studies in an effort to create the beginnings of a foundation that can guide evidenced based effective RG strategies. This paper, however, is not intended to provide a comparative critique of methodologies and design used in identified studies (e.g. sampling, study design, response rates, sample size, etc.; readers interested in research design should see, for example, Campbell & Fiske 1959; Campbell & Stanley 1963; Borkovec & Castonguay 1998). The intent is to distill the core findings that are supported by evidence.

Although we reviewed the literature published prior to and after Williams et al.’s review, the current review differs from prior literature reviews in several important respects. Instead of examining all studies relevant to RG regardless of their methodological adequacy, the present review used a parsimonious and replicable a priori set of inclusion criteria designed to maximize the external validity of findings reported in different studies. By using a priori inclusion and exclusion criteria that focused on studies with a foundation of scientifically derived empirical evidence, we avoided the prospect of reporting about studies ultimately discarded on the grounds of methodological flaws, design limitations, and poor external validity. The inclusion criteria we selected for this evaluation represent standard methodological attributes that are related to acceptable research design and methods (e.g. Campbell & Stanley 1963; Rosenthal & Rosnow 1991; Cooper & Hedges 1994; Mosteller & Colditz 1996; Bangert-Drowns et al. 1997; Podsakoff et al. 2003; Shaffer et al. 2006). It is important to consider that these criteria represent minimal features of scientifically sound research methods; if we created a more demanding and rigorous inclusion criteria, the obtained study sample would be reduced in size. Although this approach is innovative in the field of gambling studies (Shaffer & Hall 1996; Shaffer et al. 1999), and unprecedented in the field of RG studies, using meta-analytic methods to take stock of a field is commonplace among other more mature scientific fields (Hunt 1997).

Method

Search strategy

We employed two approaches to retrieve RG relevant articles. First, we conducted a systematic search of the primary academic databases PsychInfo, PubMed, Taylor and Francis Online, and ProQuest (all 44 data bases within ProQuest were included) for peer-reviewed publications using the following keywords: ‘responsible gambling’, ‘limit-setting’, ‘pre-commitment’, ‘warning messages’, ‘pop-up messages’, ‘game features’, ‘behavioral tracking’, ‘behavioral markers’, ‘behavioral indicators’, ‘self-exclusion’, ‘venue staff’, and ‘venue employees’. The term ‘responsible gambling’ was searched for independently as well as jointly with all the other terms. Second, to supplement this search, we targeted gambling-related journals directly to ensure that we captured all relevant articles not located in the selected databases. Individual journal searches were conducted for International Gambling Studies, Journal of Gambling Studies, and International Journal of Mental Health and Addiction, the main journals in the field. This search strategy targeted the period from 1962 to 31 October 2015. This approach identified 2548 publications.

Excluding the grey literature

From the 2548 identified articles, we excluded those not appearing in peer review journals. The extent to which articles appearing in the ‘grey’ literature could be validly claimed to have been independently peer-reviewed was not possible. Therefore, in the absence of peer review, the basic foundation for scientific publications, we excluded all ‘grey literature’. This decision does not in any way imply that such articles have no scientific merit; our concern was about the question of the scientific robustness and reliability of ‘grey’ literature – which is why the moniker of ‘grey’ is applied to this segment of the scientific literature.

We excluded 2496 publications that were either in the ‘grey’ literature domain, duplicates, not relevant to RG, and those containing insufficient methodological information. Figure 1 summarizes the flowchart for exclusions at each step in the review process.

Inclusion and exclusion criteria

In the next step of the review process, we retained studies if they met two criteria: (1) a specific focus on RG related topics and (2) evidence of an empirical approach toward evaluating RG strategies, initiatives, programs or theoretical content. There were 105 publications that were retained for further analysis.

Of those remaining studies, research conducted within real gambling environments with ‘real’ gamblers was retained. We excluded laboratory-based studies and simulations, and those using analog participants (e.g. university students) because these samples failed to represent actual gamblers and gambling. As a final step, we applied further methodological inclusion criteria; that is, did the
investigators use at least one of the following three methodologies: (1) matched control or comparison group; (2) repeated measures; and (3) one or more measurement scales (e.g. screening or diagnostic measures). Each of these criteria is fundamental to the conduct and scientific evaluation of RG programs. In the absence of these criteria, the ability to draw valid conclusions remains greatly limited. Of the 47 RG articles that remained, 29 articles (62\%) met at least one of the three above methodological criteria.

**Inter-rater reliability**

Using the 47 articles that were relevant to RG interests, we conducted an inter-rater reliability test to examine the potential for rating biases during the coding and evaluation process. For this procedure, two colleagues (i.e. public health data analysts) independently rated a randomly selected subset of the 47 publications \((n = 15; 32\%)\) using a mutually exclusive 19-item scale. After each coder independently rated the same 15 publications, we calculated a Cohen’s Kappa that accounts for agreement occurring by chance and specifically measures inter-rater agreement for categorical variables. It is generally thought to be a more robust measure than a simple percent agreement calculation.

Cohen’s Kappa revealed a strong aggregate level of agreement across raters for study attributes: notably, a mean kappa of 0.913 (SD = 0.138). The minimum Kappa found was .505 (i.e. type of study design), reflecting moderate agreement while the maximum Kappa was 1.00 (e.g. study time period) representing complete agreement.

**Results**

**RG study sample characteristics**

From the search, 47 articles qualified as relevant to the topic of RG; however, 18 of these failed to meet any of the three key methodology inclusion criteria. Of the 29 (62\%) qualifying as empirical studies, 11 (37\%) used a matched-control or comparison group, while 22 (73\%) were repeated measures studies, and 21 (73\%) used measurement scales to evaluate participants. Only six of the 29 articles (21\%) satisfied all three key methodology inclusion criteria: two of these were case-controls, and four were case-controls at baseline with a prospective cohort that followed. These studies evidence sound methodological strategies and the most research rigor from the body of RG studies identified.

As Figure 2 shows, 32 of the 47 (i.e. 68\%) RG articles were published after 2011, suggesting that research focusing on RG remains an increasingly popular (Kolmogorov-Smirnov; \(p < .001\)) but still nascent field of study. However, the rate of RG-related peer reviewed publications during this timeframe rapidly increased reaching a peak during 2012 and subsequently progressively declined.

Table 1 summarizes the results of our literature search. A content analysis reveals that these RG articles \((N = 47)\) focused on the following five RG strategies: (1) identifying problem gamblers by using actual gambling behavioral characteristics or behavior patterns; (2) setting gambling limits; (3) self-exclusion programs; (4) venue staff responding to patron problem gambling; and (5) specific RG features.

Using our final sample of 29 empirical studies, a comparison with Williams et al. (2012) revealed no difference in RG strategies (e.g. limit setting, self-exclusion, etc.; Chi Square = 2.02; \(df = 4; p > .73\)); however, there was a statistically significant difference between the research designs associated with the respective study samples (Chi Square = 9.83; \(df = 4; p < .05\)). This study included many more prospective and case control studies than did Williams et al. (2012).

As Table 1 shows, most RG research has focused on self-exclusion programs with the next commonly investigated areas being behavioral characteristics of actual gambling and

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1Dates might vary because publications can carry a publication date for release ahead of print and then a later date when the print version is released.
RG game features, and limit setting. Limit setting and staff responses to gambling are the least studied. We will now review and discuss what is known about each of these five content areas based on the 29 studies meeting the methodological requirement as described above (see Table 1 for the list of studies). We classified each study according to what was considered its primary area of RG focus.

Main findings and implications of five RG strategies

Despite using minimal methodological inclusion criteria, we were able to identify only 29 empirical studies focusing on RG. These studies represent only five RG strategies. Had we employed more rigorous inclusion criteria, our sample would have been even more limited. In the following section,
we will identify and briefly describe these RG strategies. The main goal of this discussion is to (1) highlight the core elements of RG programs and initiatives that meet minimal scientific criteria, (2) describe their main findings, and more importantly (3) help different stakeholders to continue research that can determine the impact and effectiveness of these RG activities.

**Self-exclusion programs**

Self-exclusion programs offer gamblers the opportunity to voluntarily ban themselves from gambling venues. Individuals self-excluding from a particular venue authorize the staff to deny them access to the venue, remove them from premises if detected, and potentially to lay charges for trespass or impose some form of penalty. Ban lengths typically range from six months to five years or lifetime. As Table 1 indicates, the literature search identified nine self-exclusion publications involving land-based or online gambling.

LaBrie et al. (2007) examined the long-term effects of self-exclusion. They followed 113 self-excluders for a period of up to 10 years from their initial enrollment. Most self-excluders reported some positive outcomes. However, half the sample breached conditions after initial enrollment.

Hing et al. (2014) conducted an evaluation of Queensland’s self-exclusion program to examine use, motivations for take-up, barriers to use, experiences and perceptions of the program, and potential improvements. Investigators interviewed 103 self-identified problem gamblers of whom 53 had and 50 had not self-excluded. Motivations for joining a self-exclusion program included financial, relational, career, legal, and health-related concerns. Barriers to take-up were described as embarrassment, stigma of joining, and concerns about confidentiality and privacy, and inconvenience of having to register at each venue.

LaBrie et al. (2007) examined 6599 people who joined a Missouri casino self-exclusion program. This study found that the annual number of self-exclusion enrollments increased during the first few years of the program, and then leveled off during the later years. During the time of this study, new casinos were introduced, which allowed for the examination of the immediate influence on proximity of new gambling opportunities on the self-excluding cohort. This study found that regional proximity had an effect on self-excluding rates. Specifically, self-exclusion was significantly correlated with regional vulnerability, exposure dose (i.e. distance of self-excluder from nearest casino), and with exposure potency (i.e. the number of casinos clustered). The results suggest a relationship between gambling proximity, gambling availability, and self-exclusion rates.

The effectiveness of self-exclusion is best determined by assessing for gambling abstinence, or at the least, a reduction in gambling after enrollment. Dragicevic et al. (2015) compared demographic and behavioral characteristics of 347 online self-excluders to 871 non-self-excluders from an Internet gambling data set. Statistically significant differences were not apparent for gender or time spent gambling. However, age differences between the two groups emerged: younger compared to older online players were more likely to self-exclude. Self-excluded gamblers experienced greater losses than non-excluders, supporting previous research that financial problems are one of the main reasons for participating in self-exclusion programs.

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Tremblay et al. (2008) designed a study to measure gamblers’ participation, satisfaction, and perceived usefulness and impacts. The findings indicated major improvements between the initial and final evaluation. There were noted improvements with regard to money spent, consequences of gambling, DSM-IV scores, and psychological distress.

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develop a model for predicting the occurrence of self-exclusion.

**Responsible gambling behavioral characteristics**

Tracking gambling behavior provides the opportunity to develop behavior-based strategies for detecting and intervening with problem gamblers. Although tracking gambling behavior using on-line sites is relatively straightforward, tracking gambling behavior for land-based sites is more difficult. Eight empirical studies have focused on the development of behavior-based algorithms for predicting problem gambling.

Quilty et al. (2014) assessed gambling frequency, expenditure, and duration of 228 community members and 275 psychiatric outpatients with the goal of developing a model that predicted gambling-related problems. Gambling involvement was assessed using the DSM-IV (American Psychiatric Association 1994) and Canadian Problem Gambling Index (CPGI: Ferris & Wynne 2001); 120 (24%) participants met criteria for lifetime pathological gambling. The results demonstrated that three gambling indicators predicted the presence or absence of problem gambling. However, cutoff points for determining problem gambling differed depending on the type of gambling activity assessed, suggesting that efforts for promoting RG should be tailored to each type of gambling offered by operators.

Delfabbro and Winefield (1999) showed that larger wins disrupted participant gambling rates; in turn, this gave rise to larger post-reinforcement pauses. However, small rewards maintained response rates. These findings also showed that, compared with infrequent poker players, regular poker players held fixed views about the profitability of given machines and were less likely to vary their wagers.

In other studies, investigators examined the behavioral patterns of actual gamblers to identify characteristics they could use to develop prevention and early intervention programs for problem gamblers (Braverman & Shaffer 2012). These studies were the first to use cluster analyses to identify groups of gamblers at higher risk for reporting gambling related problems. The authors studied a proportion of the large sample that closed their accounts during the two-year study period (about 50% of the sample). These results complement the findings of Xuan and Shaffer (2009). They investigated the last segment of a prospective period of gambling, before gamblers closed their account because of gambling-related problems. Analyzing the first segment of a longitudinal sequence is more critical than later segments if the primary purpose of the research is to identify gamblers who might later develop problems.

Schellinck and Schrans (2004a) studied behaviors and thoughts that people use to control the amount they gamble: development of budgets; avoiding locations that provide gambling; rewarding oneself for not gambling; and seeking help from others to gain control of their gambling. Two mediating variables, self-efficacy and situational temptation, were also assessed. Findings suggested a number of initiatives that might support gamblers in their efforts to moderate or eliminate their video lottery terminals (VLT) gambling.

Schellinck and Schrans (2004b) conducted research to identify combinations of behavioral, physiological, and emotional responses to gambling, to help identify problem gamblers. Better identification of problem gamblers on site can help with intervention at a higher confidence.

The remaining studies relied on data reflecting account-based betting patterns from on-line sites. These studies focused on the examination of early behavioral characteristics of online gamblers who later triggered warnings as potential problem gamblers (Gray et al. 2012, 2015), and multi-game behavioral markers for early identification of potential problem gambling (Braverman et al. 2013).

To identify behavioral markers of problem gambling, Gray et al. (2012) compared electronic gambling behavior records of bwin.party account holders who had triggered responsible gaming alert systems (n = 2066) with those who had not (n = 2066). Alerts were triggered if gamblers closed or re-opened their account, reported account problems, requested account limit changes above the maximum value, or requested customer service to impose access restrictions to online accounts. Findings revealed that non-monetary betting activity intensity (i.e. total bets placed, number of active betting days, and duration of activity), and monetary variables (i.e. total stake size and net losses) reliably discriminated gamblers triggering warnings from those who did not.

Braverman et al. (2013) analyzed the data of 4056 bwin.-party players to build a model focusing on betting activity, changes in betting patterns, gambling during specific times of the week, and use of promotional money for gambling. Of these online gamblers, 2042 had been identified previously as having entered a RG program because of various gambling patterns including account closure due to gambling problems, requesting a limit through customer service instead of on-line, requesting partial or full block of account, or being underage. Results revealed that players engaging in more than two types of gambling within their first month, and with high variability for wagers in casino gambling or live action sports betting were more likely to benefit from future RG program.

**Setting gambling limits**

Pre-commitment is a RG tool that applies to certain forms of gambling offered by both land-based and online gaming operators. The goal of this tool is to enable gamblers to preset monetary and time limits in a non-emotional state to assist them in spending only as much as they can afford to lose. Depending on the gaming venue or website, spending limits can include deposit, play, loss, win and bet limits. Time limits can be made for a session of play within daily, weekly, and monthly time frames. Five empirical studies have focused on setting gambling limits.

Auer and Griffiths (2013) examined the betting patterns and voluntary limits setting of 5000 on-line gambling account holders. Their data were from the win2day gambling website and were comprised of lottery, casino, and poker players. All players who opened an account with win2day...
were required to set time and cash-in limits. Analyses were conducted to determine if gambling behavior was different in the 30 days after compared to the 30 days before limit setting. Setting voluntary limits significantly affected monetary spending for casino and lottery gaming players. Voluntary monetary limit setting was more effective than time limits in reducing gambling behavior.

Auer and Griffiths (2014) also examined 100,000 online gamblers to measure theoretical loss as an indicator for gambling behavior. They found a correlation between the ‘bet size’ and the overall ‘theoretical loss’ across the eight game types. Although the correlation was statistically significant, the bet size alone explained only 72% of the variance associated with theoretical loss. Auer and Griffiths suggested that future studies measure their participants’ gambling intensity by incorporating the game-specific theoretical loss instead of using proxy measures such the bet size and/or the amount of money staked.

Broda et al. (2008) studied limiting setting with a sample of Internet sports betting gamblers from bwin. This study indicates that current deposit limits affect only a very small minority of Internet sports bettors. The vast majority of Internet bettors seem to be able to regulate themselves and require little additional safeguards.

Hing et al. (2015a) reported that the use of digital money contributed to higher rates of gambling and loss of control. Participants made greater use of self-limiting strategies than those available on gambling websites, such as deposit limits and self-exclusion. However, participants had variable success adhering to their own limits. Exceeding limits appeared a common experience among regular gamblers; nevertheless, problem gamblers were significantly more likely to exceed limits than lower-risk groups. Thus, the results support the tendency of regular gamblers to exceed self-imposed limits; this suggests that maintaining control over Internet gambling would benefit from operator-assisted mechanisms to enforce self-limits.

Nelson et al. (2008) studied the self-limiting behavior of Internet gamblers. Specifically, they studied 18 months of betting transactions among gamblers who subscribed to an online betting site (N = 47,134), 567 of whom utilized the site’s self-limit feature. The results showed that self-limiting gamblers played a wider variety of games and placed more bets than others prior to self-limiting. After imposing limits, self-limiters reduced their activity, but did not reduce the amount they wagered per bet. Time spent gambling, not just money wagered, appears to be an important indicator of gambling problems.

### Responsible gambling specific game features

RG game features refer to the structural characteristics of games that promote RG. Research in this area is limited; only four recent studies have been published. These focused on warning messages, and RG game features of electronic gaming machines.

Warning messages is a harm minimization strategy aimed at preventing or reducing gambling-related problems by assisting individuals to make informed choices about their gambling. Some studies have demonstrated the efficacy of warnings in facilitating RG. Gainsbury et al. (2015) report on the effectiveness of warnings appearing either in the middle or on the periphery of electronic gaming machines (EGMs) screens in commercial gambling venues. Regular gamblers were surveyed to assess their recall of warning messages and the perceived impact of message placement. Messages appearing in the middle of screens were recalled to a greater extent, and respondents reported that these were more impactful and useful than messages on the periphery of screens.

Ladouceur and Sévigny (2009) investigated the influence of three features of electronic gambling machines (i.e. clock, cash display, and pre-commitment on gambling time). Participants gambled with their own money within their natural environment. Using behavioral and self-reported measures, the study found that a majority of players reported the cash display as being a helpful feature for controlling gambling activities. However, participants did not report the clock or the pre-commitment on gambling time as being helpful. The authors concluded that the clock and pre-commitment on gambling time device might not be instrumental in promoting RG.

Munoz et al. (2013) assessed the effectiveness of graphic versus text-only gambling warnings messages designed to promote RG using a survey technique. Message content focused on how excessive gambling disrupts family or personal finances. Graphic warnings enhanced the perceived severity of the size of loss, and the likelihood of being affected by the loss, regardless of message content. Short-term gambling behavioral intent was significantly decreased when graphic warnings were paired with family disruption content, and when text-only warnings contained financial disruption content.

Blaszczynski et al. (2014) evaluated the effectiveness of five RG features for the Blue Gum gaming machine: responsible gaming messages, bank meters, alarm clocks, demo mode for playing without money, and a charity donation feature. The investigators collected data using structured interviews, questionnaires, and direct observation. Most participants were aware of at least one of the five RG features, however, only a small portion of them used any of these. The RG features did not influence gambling enjoyment with the exception of the RG messages affecting problem gamblers, with gamblers who used one feature were more likely to also use additional features.

### Training of venue employees intervening with problem gamblers

Gambling venue employees have direct contact with patrons experiencing gambling-related problems. Problem gambling awareness training has expanded in many venues to increase venue staffs’ ability to recognize problem gambling. Only three empirical studies evaluated training of venue staff.

In an attempt to evaluate the casino employee RG training program, Play Responsibly, LaPlante et al. (2012) surveyed 217 new employees before and after training. The baseline and follow-up assessments focused on employee
characteristics, and gambling-related opinions and knowledge. After training, employees provided more knowledgeable responses. However, the training had a larger influence on increasing new knowledge than it did on correcting previous inaccurate beliefs held by venue staff.

Delfabbro et al. (2012) assessed the reliability of venue staff perceptions of patrons’ problem gambling. Patrons (N = 303) completed a survey of gambling habits, EGM play, and the Problem Gambling Severity Index (Ferris & Wynne 2001). Of these participants, 230 were familiar to the venue staff and therefore included in the analyses that compared ratings between patrons’ self-reported behavior and observations from the venue staff. There was considerable disparity between staff and patron ratings of problem gambling. According to the Problem Gambling Severity Index, 22 of the patrons were classified as problem gamblers; however, only one was classified as having some problems by venue staff. Additionally, venue staff identified 15 patrons as problem gamblers when the Problem Gambling Severity Index scores indicated no risk or low risk for these players.

To explore the challenges that venue staff experience when responding to patrons with gambling problems, Hing and Nuske (2012) conducted interviews with venue staff. When approached by patrons seeking information or assistance for a gambling problem, staff reported feeling awkward about discussing personal issues, in part, because of the patrons’ own embarrassment. Staff experienced difficulties approaching patrons because of the uncertainty of the patron having a gambling problem. Being approached by a third-party raised issues of privacy and interfering with personal relationships. Venue staff, in responding to problem gamblers, reported experiencing confusion, dilemmas, and apprehension.

Discussion

This study represents the first empirical investigation focusing on the impact and efficacy of RG strategies. By using a systematic approach to identifying research studies, this project establishes a methodological foundation upon which other investigators can build. Establishing evidence-based RG practices is important because, “Unfortunately, the development, implementation, and evaluation of most of these initiatives have been a haphazard process. Most have been put in place because they “seemed like good ideas” and/or were being used in other jurisdictions, rather than having demonstrated scientific efficacy or being derived from a good understanding of effective practices in prevention (Williams et al. 2012, p. 6). The field remains without a systematic approach for evaluating the body of evidence related to RG. Consequently, this study provides an important contribution to the field of RG studies by creating a system for identifying studies by defining threshold level methods capable of demonstrating scientific efficacy that can support the use of RG activities.

Williams et al. (2012) included only eight RG articles (17%) of the 47 RG studies retained for analysis identified by the present empirical literature review. Similarly, only seven of the final 29 empirical studies (i.e. 25%) identified by this study were included in the Williams et al. (2012) meta-analysis. Importantly, 23 RG articles were published after Williams et al. (2012). Fifteen of these studies were published before Williams et al. (2012) but not included in their review.

In this context, the current review differs from prior literature reviews in several respects. Instead of critically examining all studies relevant to RG regardless of their methodological adequacy, we used a limited a priori set of inclusion criteria designed to maximize the external validity of findings reported in different studies. By using a priori criteria, we avoided the lengthy discussion of studies that ultimately will be discarded on the grounds of methodological flaws, design limitations, and poor external validity. By using replicable inclusion and exclusion criteria, this study makes it possible to track the development and growth of the science associated with RG systematically. Absent a systematic approach to gathering the scientific literature about RG, it is difficult to develop evidence-based prevention, treatment or policy practices. Without systematic evaluation, it simply is impossible to determine the best available practices.

The main findings of the present review of RG literature, based on minimal methodological requirements, indicates five specific areas of scientific research that provide the opportunity to draw some best practice in using: (1) self-exclusion; (2) gambling behavior to develop algorithms that can identify sentinel events; (3) limit setting; (4) responsible gambling machine features; and (5) employees training.

In brief, self-exclusion programs demonstrate some effectiveness as a component of RG programs despite various limitations including low utilization rates, breaching the agreement, and minimal evidence about the long-term outcomes. Although there is an increase in research focusing on behavioral indicators of gambling-related problems, the current state of knowledge remains underdeveloped. There is a lack of conclusive evidence about integrating these tools within fully developed RG programs. There is a growing focus on algorithms and diagnostic criteria that might be effective for identifying potential gambling-related problems. Unfortunately, some of the currently offered algorithms and diagnostic systems are not based on empirical evidence or actual gambling behaviors. Limit setting has been assessed in terms of monetary and time limits, and mandatory and voluntary limit setting. There is empirical evidence that suggests that limit setting can be effective for promoting RG. However, it is important to remember that limit setting only is effective for some individuals (Shaffer et al. 2010); it can increase gambling problems for others. Therefore, we recommend that stakeholders carefully and conservatively consider the potential consequences of limit setting efforts. Machine features are modestly effective for limiting excessive gambling. Finally, venue staff providing assistance to patrons experiencing problem gambling demonstrates partial effectiveness as a useful RG initiative.

Limitations

As with any study, there are limitations to this empirical review of the extant RG research. This systematic analysis
and synthesis of the RG literature should be regarded a ‘first approximation’ to summarizing the literature while taking into account the methodological quality of studies. Some would differ with the logic of our coding system. Others would disagree by adding or subtracting items or algorithms to our methodological rating system. Still others would quarrel with our data weighting strategies or multi-method approach to drawing conclusions. Miller et al.’s (cf. Shaffer et al., in press) synthesis of the alcohol treatment literature included a caveat that also applies to this project: despite our multi-step ‘… review process to minimize errors, it is likely that … there are over-looked details, and surely judgment calls for specific studies on which reasonable colleagues would disagree’ (p. 31).

This study identified only 29 studies using only some of the scientific methods that provide the scientific rigor necessary to offer interpretive confidence; importantly, only six of these studies met all three inclusion criteria for scientific rigor. Further, we could have used more than three methodological inclusion criteria to identify even more stringent and optimal research methods. This approach would have yielded a sample of empirical studies so small that drawing any conclusions would be difficult at best. Consequently, the evidence reveals that the field of RG is nascent and there are few principles or RG activities that can be considered ‘best practices’. Presuming best practices is a risky undertaking; adopting perceived best practices might produce unintended adverse effects. Protecting gamblers from inadvertent harms (e.g., increasing the incidence or prevalence of gambling problems; increasing adverse levels of stress and anxiety) that can result from well-intentioned efforts to prevent problems must be the foundation of RG programs (Broda et al. 2008; Nelson et al. 2008).

In closing, the current evidence about RG initiatives and programs is very limited. Using minimal methodological criteria, this study identified a small sample of scientific research focusing on RG. Had we used more rigorous methodological inclusion criteria, we would have identified less than seven studies that focused on RG. This evidence reveals that the overall effectiveness and impact of these RG activities remains uncertain. Consequently, the field has not yet progressed to best practices that are supported by scientific evidence; RG programs mostly remain at the ‘seemed like a good idea’ stage of development. This observation and conclusion raise important concerns when we take into account the costs (e.g., time, money and other resources) associated with the RG programs already implemented in many gambling venues around the world. This contrast leads to the following conclusion and the steps that urgently need to be taken.

As there are few studies that meet rigorous criteria for the study of RG, we encourage RG activists to develop and implement programs that assure the wellbeing of gamblers who might be placed at inadvertent risk of harm from well-intended RG activities that fail to achieve their intended objectives. In this context, different stakeholders need to work in collaboration to develop – and more importantly to evaluate – the efficacy and impact of RG initiatives.

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Disclosure statement

The authors declare that they have no competing interests.
Appendix

RG Articles

This appendix includes the 18 RG articles that failed to satisfy any of the three methodological criteria necessary for inclusion among the final set of empirical RG studies.


