

2016

# Mental health and online, land-based and mixed gamblers

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## Publication details

Post print of: Blaszczynski, A, Russell, A, Gainsbury, SM & Hing, N 2016, 'Mental health and online, land-based and mixed gamblers', *Journal of Gambling Studies*, vol. 32, no. 1, pp. 261-275.

Published version available from:

<http://dx.doi.org/10.1007/s10899-015-9528-z>

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**Mental Health and Online, Land-Based and Mixed Gamblers**  
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**Cite as:**

Blaszczynski, A., Russell, A., Gainsbury, S., & Hing, N. (published online Mar 6, 2015). Mental health and online, land-based and mixed gamblers. *Journal of Gambling Studies*. DOI 10.1007/s10899-015-9528-z

**Available at:** <http://link.springer.com/article/10.1007/s10899-015-9528-z#page-1>

**Abstract**

Although high rates of problem gambling have been identified among Internet gamblers, most studies have failed to identify the relative contribution of multiple forms of gambling as opposed to the exclusive participation in online forms. The aim of this study was to investigate differences in mental health status in exclusive online, exclusive land-based, and mixed Internet and land-based samples of gamblers drawn from the general population. A sample of 4,594 respondents completing an online survey were categorised as exclusive online, land-based and mixed form gamblers. Participants completed a questionnaire eliciting demographic details, participation on all forms of gambling, use of alcohol, tobacco and drugs, help-seeking, and personal problems experienced due to gambling, as well as measures of problem gambling and psychological distress. Findings indicated that mixed gamblers exhibited higher problem gambling scores, level of gambling involvement, and consumption of alcohol during gambling than exclusive online gamblers. Land-based gamblers experienced higher levels of psychological distress, self-acknowledged need for treatment, and help-seeking behaviour. These findings suggest that exclusive online gamblers represent a different subpopulation at lower risk of harm compared to gamblers engaging in multiple forms. Understanding the characteristics of different problem gambling subpopulations may inform the development of more effective targeted interventions.

**Keywords:** problem gambling, online gambling, Internet gambling, psychological distress, land-based gambling, alcohol use

## Introduction

High rates of mental health problems are found among individuals meeting criteria for pathological gambling or its more recent DSM-5 designation, gambling disorder (American Psychiatric Association, 2013). Both epidemiological survey data (Bischof, Meyer, Bischof, Kastirke, John, & Rumpf, 2013; Cunningham-Williams, Cottler, Compton, et al., 1998; Gerstein, Volberg, Toce, Harwood, et al., 1999; Lorains, Cowlshaw, & Thomas, 2011; Petry, Stinson, & Grant, 2005; Pilver, Libby, Hoff, & Potenza, 2013) and clinical studies (Blaszczynski & Steel, 1998; Hodgins, Stea, & Grant, 2011; Maccallum & Blaszczynski, 2002; Shek, Chan, & Wong, 2013; Steel & Blaszczynski, 1998; Stinchfield & Winter, 2001) point to the presence of a positive functional relationship between gambling disorder severity and mental health morbidity (Bischof et al., 2013). For example, data suggest a six-fold magnitude of increased risk for substance use, four-fold risk for illicit substance dependence, and three-fold risk for mood disorders for pathological as compared to non-pathological gamblers (Petry, Stinson, & Grant, 2005). Elevated morbidity rates relative to the general population are also found among at-risk gamblers (Bischof et al., 2013).

To date, most studies have investigated the presence of comorbid conditions irrespective of the preferred form of gambling (wagering, electronic gaming machines, poker), or mode of gambling, that is, land-based or online/Internet. The aggregation of all forms of gambling is appropriate for studies conducted prior to the late 1990s given these forms were offered predominantly in land-based venues. However, more recent advances in virtual communication and technology have now markedly changed the gambling environment. Since the early 2000s, Internet access and greater economies of scale associated with the production, cost and availability of computing, personal (iPad and other tablets) and smartphone (Android and IOS based) devices have resulted in widespread easy Internet access. Current estimates indicate that there are in the vicinity of 2.4 billion Internet users worldwide representing 16%-79% of the populations of non-developed and developed countries, with a growth rate of 566% found over the decade or so from 2000 to 2012 (Internetworldstats.com, 2014).

In addition, enhancements in software capabilities and marketing promotions have led to the increased sophistication and consequently attractiveness of online gambling products being offered through mobile and Internet platforms. Internet, mobile, remote or interactive gambling are terms often used interchangeably but all effectively refer to the use of virtual communication platforms either to place bets/wagers, interact with other gamblers as in Texas Hold'em Poker, or participate in standalone gaming machine or casino type (roulette) simulated games. Globally, online gambling accounts for 8% of the gambling market with revenue estimated to be in the vicinity of €24.6 billion in 2011 (H2 eGaming Dataset, 2012). The prevalence rate of online gambling ranges from 0.1% to 13% (Broda, LaPlante, Nelson, LaBrie, Bosworth, & Shaffer, 2008; Hing, Gainsbury, Blaszczynski, Wood, Lubman & Russell, 2014; Ladd & Petry, 2002; Productivity Commission, 1999; Sproston, Hing, & Palankay, 2012; Wardle, Moody, Griffiths, Orford, & Volberg, 2011; Wood & Williams, 2011), with indications that poker players and sports/race wagering are popular and over-represented forms found among this subpopulation of gamblers (Gainsbury, Russell, Wood, Hing, & Blaszczynski, 2014; Hing et al., 2014; Jiménez-Murcia, Stinchfield, Fernández-Aranda, Santamaría, Penelo, Granero,

Gómez-Pena, Aymami, Moragas, Soto, & Manchón, 2014; Kairouz, Paradis, & Nadeau, 2012).

In response to the growth of online gambling, attention is increasingly being directed toward furthering our understanding of the subpopulation of individuals using this medium. Online gamblers appear to be more likely to engage in multiple forms of gambling with higher levels of frequency and monetary expenditure (Gainsbury, Wood, Russell, Hing, & Blaszczynski, 2012; Gainsbury, Russell, Hing, Wood, & Blaszczynski, 2013; Gainsbury, Russell, Wood, Hing, & Blaszczynski, 2014; Hing et al., 2014). Not surprisingly, a number of studies have found higher rates for gambling disorders among online compared to land-based gamblers (Hing et al., 2014; Productivity Commission, 2010; Wardle, Moody, Griffiths, Orford, & Volberg, 2011; Wood & Williams, 2010), although this tendency may reflect heavier involvement in multiple forms of gambling activities spanning both land-based and Internet media (Philander & MacKay, 2014).

In this context, a number of studies have investigated differences in pathological gambling prevalence, socio-demographic, social facilitation, and gambling-related variables between online and land-based gamblers (Cole, Barrett, & Griffiths, 2011; Gainsbury et al., 2012; Griffiths, & Barnes, 2008; Griffiths, Wardle, Orford, Sproston, & Erens, 2009; Hing et al., 2014; Wardle, Moody, Griffiths, Orford, & Volberg, 2011; Wood and Williams, 2011; Woolley, 2003). These studies consistently identify male gender, younger age, higher educational attainment, fulltime employment, and higher income status as key predictors of online gambling (Griffiths, Wardle, Orford, Sproston, & Erens, 2009; Hing et al., 2014; Lloyd, Doll, Hawton, Geddes, Goodwin, Rogers, 2010; Petry & Weinstock, 2007).

In a survey of 2,799 Australian Internet gamblers, slightly less than two-thirds reported the emergence of gambling problems subsequent to commencing online gambling (Gainsbury, Russell, Wood, Hing, & Blaszczynski, 2014). More online gamblers reported consuming alcohol and illicit drugs compared to land-based gamblers (Griffiths, et al., 2009; Kairouz, Paradis, & Nadeau, 2012; Wood & Williams, 2011) although others reported similar trends for alcohol but not for drug use during gambling (Gainsbury et al., 2014). Of 4,185 respondents to an online survey, significantly more land-based than online gamblers reported health and psychological problems related to their gambling (Gainsbury et al., 2013).

In a qualitative analysis of six online and nine land-based gamblers, McCormack and Griffiths (2011) found all fifteen participants reported emotional problems manifested by low self-esteem and self-worth, humiliation, shame, and anger and frustration if unable to gamble. The majority also described mental health problems related to depression, anxiety, stress and suicidality, and two from each group, physical health problems associated with sleep disturbances, poor nutrition, and neglect of health.

Jiménez-Murcia, Stinchfield, Fernández-Aranda, Santamaría, Penelo, Granero, Gómez-Pena, Aymami, Moragas, Soto, and Manchón (2014) dichotomized a consecutive series of 1,025 hospital outpatient pathological gamblers into exclusive online ( $n = 53$ ) and exclusive non-online ( $n = 962$ ) participants. Statistical analyses revealed significant differences between groups on education and socio-economic status, but no significant differences on variables related to age, income, gender,

employment or marital status. With respect to psychopathology, no significant between-group differences were found on Derogatis' (2002) Symptom Checklist-90-Revised scale scores, temperament and character dimensions assessed by the Cloninger's (1999) Temperament and Character Inventory-Revised scale, and suicidal attempts and ideation. The groups did not differ on measures of gambling severity using SOGS and DSM-IV criteria but the online group manifested higher levels of expenditure and incurred debts. However, it is not surprising that differences in levels of psychopathology were not found given that both samples were drawn from the same tertiary hospital program offering treatment for pathological gamblers at perhaps the more severe end of the spectrum (mean SOGS scores of 10-11; DSM-IV criteria met = 7).

These inconsistent reported findings on mental health indices in gambling disorders may be accounted for by comparing mixed samples of Internet and land-based gamblers to non-Internet samples of gamblers, or non-representative clinical populations characterised by high levels of comorbid conditions attending specialised hospital-based programs. Accordingly, the purpose of this exploratory study was to investigate differences in mental health status in exclusive online, exclusive land-based, and mixed Internet and land-based samples of gamblers drawn from the general population.

## **Method**

### **Participants**

Participants were 4,594 respondents completing an online survey as part of a larger national gambling study (Hing et al., 2014). Inclusion criteria were having gambled in the last twelve months, being 18 years and older, and English speaking. Respondents were recruited through advertisements placed on various websites; 53.9% of respondents reported being informed of the survey on online wagering/lottery sites, 17.6% via a Facebook advertisement and 6.3% via Google advertisements. The full survey completion rate was 68.7% and the mean time to complete the survey was 23.1 minutes.

Participants were classified into one of three subgroups according to their responses to specific items relating to their mode of gambling: exclusive online, exclusive land-based, and mixed online/land-based gambling. These groups have been compared in terms of demographics, gambling behaviour and problem gambling elsewhere (Gainsbury et al., under review).

The complexity inherent in defining an online gambler is well described by Wardle, Moody, Griffiths, Orford, and Volberg (2011). As these authors note, many land-based gamblers occasionally or often engage in online gambling and vice versa. Thus, it becomes difficult to define an arbitrary threshold of online/land-based that can be used to adequately distinguish each group. The convention used in other studies (Olason, Kristjansdottir, Einarsdottir, Haraldsson, Bjarnason, & Derevensky, 2011; Productivity Commission, 1999; Wardle, Moody, Griffiths, Orford, & Volberg, 2011; Wood & Williams, 2011), were followed here. Accordingly, to classify respondents in one of the above three subgroups, respondents were asked "In terms of your gambling over the last 12 months, which of the following statements is most accurate for you?" Available response options were: "I have only gambled online in the last 12 months", "I have mostly gambled online, but I have sometimes gambled offline",

“About half of my gambling has been online and half has been offline”, “I have mostly gambled offline, but I have sometimes gambled online” and “I have never gambled on the Internet in the last 12 months”. Offline refers to land-based gambling.

### Measures

The full online survey contained nine sections covering a range of gambling behaviours, attitudes, knowledge and status. For the present study, data relating to standard demographic details, participation, help-seeking behaviours, and personal problems experienced due to gambling (interpersonal, work/study, financial and personal) were extracted for analysis.

*Internet gambling behaviour.* In respect to Internet gambling, respondents were asked to indicate if gambled on the Internet on any form of gambling in the past twelve months, and report their patterns of online gambling, and items related to sleep and eating disruptions.

*The Canadian Problem Gambling Index-Problem Gambling Severity Index (CPGI-PGSI, Ferris & Wynne, 2001):* The nine-item PGSI self-report questionnaire from the CPGI was used to classify gambling status. Each item is scored along a 4-point Likert scale: Never (0), sometimes (1), most of the time (2), and almost always (3). Total scores range from 0 to 27, with higher scores indicating greater risk of problem gambling. Cut-off scores adhered to those used in original validation of the PGSI: 0 = non-problem gambler, 1-2 = low risk gambler, 3-7 = moderate risk gambler and 8-27 = problem gambler. The PGSI has a demonstrated a test-retest reliability score of .78 and a Cronbach’s alpha of .84, indicating good internal consistency and stability (Ferris & Wynne, 2001). A comparison of PGSI scores for these samples have been reported (Gainsbury et al., under review) but are included in this paper to provide readers with relevant data to place the current findings into context. It is important to assess whether difference between groups in terms of help-seeking are related to mode or severity of gambling.

*Kessler Psychological Distress Scale: (K6: Kessler, Andrews, Colpe, Hiripi, Mroczwk, Normand, Walters, & Zaslavsky, 2002).* The Kessler 6 scale was used to assess the presence of non-specific psychological distress experienced over the most recent four weeks. This measure was selected on the basis of Kessler et al.’s (2002) description of several advantages of the K6: its brevity, strong psychometric properties, and ability to discriminate DSM-IV cases from non-cases in general-purpose health surveys. These authors indicated that the measure is useful in population and clinical studies as it measures the severity of non-specific distress likely to be found in clinical samples. The K6 is strongly correlated to the K10 and other clinical assessments of serious mental illness (Kessler, Green, Gruber, Sampson, et al., 2010).

For each of the six K6 items covering symptoms of nervousness, hopelessness, restlessness, depression, worthlessness, and effort, the response options were: ‘none of the time’ (0), ‘a little of the time’ (1), ‘some of the time’ (2), ‘most of the time’ (3) and ‘all of the time’ (4). A sum of the scores on all six items was calculated to give an index of psychological distress. Despite the widespread use of the K6, no clear optimal scoring standards are available (Kessler, Green, Gruber, Sampson, et al.,

2010). The most commonly used thresholds based on validation studies were therefore used in this study: scores of 0-12 no distress, 13+ indicating mild to high levels of distress.

#### *Gambling related consequences*

The respondents were asked whether they had experienced 33 consequences over the last 12 months due to their gambling. For some of these consequences, the response options were “Never”, “Rarely”, “Sometimes”, “Often” and “Always”, while for others they were yes/no questions. All were recoded into yes/no questions, with any response other than “none of the time” or “never” treated as a yes. These consequences were divided into four broad categories: personal problems (Table 4), interpersonal problems (Table 5), work or study problems (Table 6) and financial problems (Table 7).

#### *Statistical analyses*

All analyses compared the three groups described above. Where dependent variables were continuous, one-way ANOVAs with Tukey pairwise comparisons were used in the analyses. Chi-square analyses with Bonferroni adjusted Z-tests were used in cases of categorical dependent variables. Alpha was set at 0.05 for all analyses unless stated otherwise.

### **Results**

Of the sample, 608 respondents were classified as “exclusive online gamblers” (endorsed the first response option), 1,416 as “exclusive land-based” (endorsed the last response option), and 2,570 “mixed online/land-based” (endorsed one of the other response options). These groups are referred to in the text as online, land-based and mixed, respectively.

The mean age of the mixed subgroup was significantly lower compared to the online and land-based groups with the latter two being no different from each other (mixed:  $M = 40.16$  ( $SD = 13.93$ ); online:  $M = 44.34$  ( $SD = 14.78$ ); land-based:  $M = 44.78$  ( $SD = 15.41$ )  $F(2,4591) = 54.22$ ,  $p < 0.001$ ).

For gender, a chi-square analysis with post-hoc Z-tests revealed a significantly higher proportion of females in the land-based (40%) compared to online (14%) and mixed (14%) subgroups, the latter two showing no significant difference ( $\chi^2(2, N = 4,594) = 389.84$ ,  $p < 0.001$ ,  $\Phi = 0.29$ ).

The mixed subgroup obtained significantly higher PGSI scores compared to the land-based and online subgroups with no difference found for the online and land-based subgroups: online:  $M = 2.39$  ( $SD = 3.92$ ); mixed  $M = 3.62$  ( $SD = 4.90$ ); and land-based  $M = 2.82$  ( $SD = 5.13$ ) ( $F(2,4591) = 22.23$ ,  $p < 0.001$ ). Table 1 shows the proportion of respondents classified within each of the PGSI categories by subgroup status. Proportionally more of the mixed and land-based gamblers were classified within the problem gambling category compared to the online subgroup. The Cronbach’s alpha for the PGSI was acceptable at 0.93.

Table 1: PGSI scores for online, mixed and land-based subgroups

PGSI Category	Online	Mixed	Land-based
	N (%)	N (%)	N (%)
Non-problem gambler	280 <sup>a</sup> (46.1)	825 <sup>b</sup> (32.1)	756 <sup>c</sup> (53.4)
Low risk gambler	144 <sup>a</sup> (23.7)	656 <sup>a</sup> (25.5)	265 <sup>b</sup> (18.7)
Moderate risk gambler	134 <sup>a</sup> (22.0)	685 <sup>a</sup> (26.7)	206 <sup>b</sup> (14.5)
Problem gambler	50 <sup>a</sup> (8.2)	404 <sup>b</sup> (15.7)	189 <sup>b</sup> (13.3)

*Note:* Groups with the same superscripts do not differ significantly.

### Substance use and mental health

Table 2 shows the reported frequency of alcohol consumption when gambling. A significantly higher proportion of mixed gamblers consumed alcohol ‘sometimes’ when gambling compared to the land-based and online gamblers. The latter two groups did not differ from each other. The land-based and mixed gamblers on average were found to have consumed alcohol more often when gambling compared to online gamblers.

Table 2: Substance use while gambling reported by online, land-based and mixed gamblers

Substance	Levels	Online	Mixed	Land-based
		N (%)	N (%)	N (%)
Alcohol	Never	370 <sup>a</sup> (60.9)	766 <sup>b</sup> (29.8)	648 <sup>c</sup> (45.8)
	Sometimes	192 <sup>a</sup> (31.6)	1,330 <sup>b</sup> (51.8)	451 <sup>a</sup> (31.9)
	Most of the time	35 <sup>a</sup> (5.8)	320 <sup>b</sup> (12.5)	153 <sup>b</sup> (10.8)
	Almost always	11 <sup>a</sup> (1.8)	154 <sup>b</sup> (6.0)	164 <sup>c</sup> (11.6)
$\chi^2 (6, N = 4,594) = 340.56, p < 0.001, \Phi = 0.27$				
Drugs	Never	589 <sup>a</sup> (96.9)	2,376 <sup>b</sup> (92.5)	1,359 <sup>a</sup> (96.0)
	At least sometimes	19 <sup>a</sup> (3.1)	194 <sup>b</sup> (7.5)	57 <sup>a</sup> (4.0)
$\chi^2 (2, N = 4,594) = 30.08, p < 0.001, \Phi = 0.08$				

*Note:* Groups with the same superscripts do not differ significantly.

Similarly, a significantly higher proportion of mixed gamblers reported using illicit drugs while gambling at least sometimes compared to both other groups. Respondents were also asked whether they used drugs ‘most of the time’ or ‘almost always’ but cell sizes were too small for comparative purposes and therefore combined with the ‘at least sometimes’ category for statistical purposes.

### K6 and preferred mode of gambling

An analysis of the K6 scores according to mode of gambling revealed that a significantly greater proportion of land-based gamblers were categorised as experiencing serious distress compared to the remaining two groups (Table 3).

Table 3: Kessler 6 scores by subgroups of gamblers (Cronbach’s alpha = 0.93)

Kessler 6 category	Online	Mixed	Land-based	
	N (%)	N (%)	N (%)	
Not high psychological distress	584 <sup>a</sup> (96.1)	2,420 <sup>a</sup> (94.2)	1,300 <sup>b</sup> (91.8)	
High psychological distress	24 <sup>a</sup> (3.9)	150 <sup>a</sup> (5.8)	116 <sup>b</sup> (8.2)	
$\chi^2 (2, N = 4,594) = 15.19, p < 0.001, \Phi = 0.06$				

*Note:* Groups with the same superscripts do not differ significantly.

**Consequences related to gambling**

There were no significant differences between the groups for 13 of the 33 more serious consequences assessed in the survey; suicide attempts, domestic abuse, separation or divorce, bankruptcy, eviction/repossession, and trouble with the law including prison sentences (see Tables 4-7: 2 personal, 4 interpersonal, 7 financial). However, it is noted that respondents relatively rarely endorsed these serious consequences. Of the remaining 20 consequences, a significantly higher proportion of mixed mode gamblers reported experiencing negative consequences compared to both online and land-based gamblers; 14 consequences endorsed (7 personal, 4 interpersonal, 2 work and study, 1 financial), and compared to one of the other groups for the remaining six consequences (1 interpersonal, 2 work and study, 3 financial). Taken together, the results indicate that mixed mode gamblers are generally more likely to have experienced negative consequences due to their gambling over the last 12 months compared to those who gamble exclusively via one mode, although this finding does not extend to the more serious consequences.

Table 4 – Personal problems due to gambling in the last 12 months ( $N = 4,594$ )

Personal consequence	Online	Mixed	Land-based	Inferential Statistic
	N (%)	N (%)	N (%)	
Gambling has been the main cause of Kessler 6 symptoms	125 <sup>a</sup> (20.6)	762 <sup>b</sup> (29.6)	245 <sup>a</sup> (17.3)	$\chi^2 (2, N = 4,594) = 81.25,$ $p < 0.001, \Phi = 0.13$
Been under a doctor's care because of depression, stress or anxiety	22 <sup>a</sup> (3.6)	114 <sup>a</sup> (4.4)	73 <sup>a</sup> (5.2)	n.s.
Seriously thought about or attempted suicide as a result of gambling	20 <sup>a</sup> (3.3)	107 <sup>a</sup> (4.2)	71 <sup>a</sup> (5.0)	n.s.
Life has been less enjoyable	160 <sup>a</sup> (26.3)	958 <sup>b</sup> (37.3)	319 <sup>a</sup> (22.5)	$\chi^2 (2, N = 4,593) = 100.18,$ $p < 0.001, \Phi = 0.15$
Wanted to stop gambling but did not think I could	113 <sup>a</sup> (18.6)	692 <sup>b</sup> (26.9)	272 <sup>a</sup> (19.2)	$\chi^2 (2, N = 4,593) = 39.40,$ $p < 0.001, \Phi = 0.09$
My need to gamble has been too strong to control	113 <sup>a</sup> (18.6)	732 <sup>b</sup> (28.5)	261 <sup>a</sup> (18.4)	$\chi^2 (2, N = 4,593) = 61.86,$ $p < 0.001, \Phi = 0.12$
Gambling has been more important than anything else I do	129 <sup>a</sup> (21.2)	727 <sup>b</sup> (28.3)	221 <sup>c</sup> (15.6)	$\chi^2 (2, N = 4,593) = 83.55,$ $p < 0.001, \Phi = 0.14$
Gambling has constantly been on my mind	204 <sup>a</sup> (33.6)	1,027 <sup>b</sup> (40.0)	312 <sup>c</sup> (22.0)	$\chi^2 (2, N = 4,592) = 131.43,$ $p < 0.001, \Phi = 0.17$
I have gambled in order to escape from worries or troubles	115 <sup>a</sup> (18.9)	788 <sup>b</sup> (30.7)	319 <sup>a</sup> (22.5)	$\chi^2 (2, N = 4,593) = 52.02,$ $p < 0.001, \Phi = 0.11$

*Note:* Superscripts indicate between-group differences. Groups with the same superscripts do not differ significantly. A group with two superscripts (<sup>a, b</sup>) does not differ significantly from either of the other groups.

Table 5 – Interpersonal problems due to gambling in the last 12 months ( $N = 4,594$ )

Interpersonal consequence	Online	Mixed	Land-based	Inferential Statistic
	N (%)	N (%)	N (%)	
Gambling has left me with not enough time to look after my family's interests	85 <sup>a</sup> (14.3)	478 <sup>b</sup> (19.1)	157 <sup>a</sup> (11.8)	$\chi^2 (2, N = 4,430) = 35.85,$ $p < 0.001, \Phi = 0.09$
Gambling has caused arguments with my family	82 <sup>a</sup> (13.8)	587 <sup>b</sup> (23.2)	197 <sup>a</sup> (14.7)	$\chi^2 (2, N = 4,463) = 54.72,$ $p < 0.001, \Phi = 0.11$
Gambling has led to incidents of domestic abuse within my household	19 <sup>a</sup> (3.2)	114 <sup>a</sup> (4.5)	50 <sup>a</sup> (3.8)	n.s.
Gambling has led to other incidents of abuse involving family, friends or others	22 <sup>a</sup> (3.7)	139 <sup>a</sup> (5.5)	61 <sup>a</sup> (4.6)	n.s.
Gambling has impacted negatively on my relationship with any of my children	37 <sup>a</sup> (6.6)	188 <sup>a</sup> (8.0)	77 <sup>a</sup> (6.0)	n.s.
People close to me have had difficulties trusting me due to my gambling	42 <sup>a</sup> (7.0)	309 <sup>b</sup> (12.2)	115 <sup>a</sup> (8.6)	$\chi^2 (2, N = 4,478) = 20.61,$ $p < 0.001, \Phi = 0.07$
I, and people close to me, have put off doing things together as a result of your gambling	61 <sup>a</sup> (10.2)	389 <sup>b</sup> (15.3)	141 <sup>a</sup> (10.5)	$\chi^2 (2, N = 4,485) = 23.20,$ $p < 0.001, \Phi = 0.07$
Gambling has led to the break-up of an important relationship in my life, or separation or divorce	56 <sup>a</sup> (10.4)	229 <sup>a</sup> (10.0)	140 <sup>a</sup> (11.9)	n.s.
Gambling has led to me losing contact with any of my children	51 <sup>a, b</sup> (10.6)	167 <sup>b</sup> (8.6)	126 <sup>a</sup> (11.9)	$\chi^2 (2, N = 3,489) = 9.03,$ $p = 0.011, \Phi = 0.05$

*Note:* Superscripts indicate between-group differences. Groups with the same superscripts do not differ significantly. A group with two superscripts (<sup>a, b</sup>) does not differ significantly from either of the other groups.

Table 6 – Work and study problems due to gambling in the last 12 months ( $N = 4,594$ )

<b>Work and study consequence</b>	<b>Online</b>	<b>Mixed</b>	<b>Land-based</b>	<b>Inferential Statistic</b>
	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	
I have lost time from work or study due to gambling	77 <sup>a</sup> (13.7)	522 <sup>b</sup> (21.1)	109 <sup>c</sup> (8.6)	$\chi^2 (2, N = 4,311) = 98.88,$ $p < 0.001, \Phi = 0.15$
Gambling has adversely affected how well I perform at work	61 <sup>a</sup> (10.9)	433 <sup>b</sup> (17.5)	121 <sup>a</sup> (9.5)	$\chi^2 (2, N = 4,304) = 50.01,$ $p < 0.001, \Phi = 0.11$
Changed jobs due to gambling related problems	38 <sup>a, b</sup> (7.1)	133 <sup>b</sup> (5.6)	101 <sup>a</sup> (8.5)	$\chi^2 (2, N = 4,110) = 10.73,$ $p = 0.005, \Phi = 0.05$
Sacked from my job due to gambling related problems	38 <sup>a, b</sup> (7.1)	116 <sup>b</sup> (4.9)	97 <sup>a</sup> (8.1)	$\chi^2 (2, N = 4,126) = 15.25,$ $p < 0.001, \Phi = 0.06$

*Note:* Superscripts indicate between-group differences. Groups with the same superscripts do not differ significantly. A group with two superscripts (<sup>a, b</sup>) does not differ significantly from either of the other groups.

Table 7 – Financial problems due to gambling in the last 12 months ( $N = 4,594$ )

Financial consequence	Online	Mixed	Land-based	Inferential Statistic
	N (%)	N (%)	N (%)	
I have borrowed from someone and not paid them back as a result of my gambling	23 <sup>a</sup> (3.9)	202 <sup>b</sup> (8.0)	84 <sup>a, b</sup> (6.5)	$\chi^2 (2, N = 4,412) = 13.02$ , $p = 0.001$ , $\Phi = 0.05$
My gambling has left me with no money to pay my rent or mortgage	35 <sup>a</sup> (6.0)	226 <sup>b</sup> (9.1)	107 <sup>a, b</sup> (8.4)	n.s.
My gambling has left me with no money to pay my household bills	39 <sup>a</sup> (6.0)	321 <sup>b</sup> (12.8)	149 <sup>b</sup> (11.5)	$\chi^2 (2, N = 4,397) = 17.68$ , $p < 0.001$ , $\Phi = 0.06$
My gambling has made it harder to make money last from one payday (or pension day) to the next	73 <sup>a</sup> (12.4)	614 <sup>b</sup> (24.4)	224 <sup>c</sup> (17.2)	$\chi^2 (2, N = 4,409) = 54.71$ , $p < 0.001$ , $\Phi = 0.11$
Debts from my gambling caused me to be declared bankrupt	17 <sup>a</sup> (3.0)	78 <sup>a</sup> (3.2)	44 <sup>a</sup> (3.6)	n.s.
My gambling has led to the sale, repossession or eviction from my house	16 <sup>a</sup> (2.8)	75 <sup>a</sup> (3.1)	45 <sup>a</sup> (3.7)	n.s.
My gambling has led to the loss of superannuation, investment or savings funds	25 <sup>a</sup> (4.3)	195 <sup>b</sup> (7.9)	102 <sup>b</sup> (8.2)	$\chi^2 (2, N = 4,289) = 9.97$ , $p = 0.007$ , $\Phi = 0.05$
My gambling has led me to steal or to obtain money illegally (even if I intended to pay it back)?	24 <sup>a</sup> (3.9)	119 <sup>a</sup> (4.6)	55 <sup>a</sup> (3.9)	n.s.
I have been in trouble with the police because of activities related to my gambling	14 <sup>a</sup> (2.3)	58 <sup>a</sup> (2.3)	25 <sup>a</sup> (1.8)	n.s.
I have appeared in court on charges relating to my gambling	12 <sup>a</sup> (2.0)	51 <sup>a</sup> (2.0)	24 <sup>a</sup> (1.7)	n.s.
Gambling has led to a prison sentence?	12 <sup>a</sup> (2.0)	44 <sup>a</sup> (1.7)	21 <sup>a</sup> (1.5)	n.s.

*Note:* Superscripts indicate between-group differences. Groups with the same superscripts do not differ significantly. A group with two superscripts (<sup>a, b</sup>) does not differ significantly from either of the other groups.

### Help seeking behaviour

Respondents were asked to indicate the extent to which they ever considered that they had a gambling problem, and if they had ever sought help. A significantly higher proportion of land-based compared to online and mixed gamblers reported that they both identified a need for help (land-based:  $n = 186$  (47.0%), mixed;  $n = 421$  (38.7%), online:  $n = 46$  (25.0%);  $\chi^2(2, N = 1,666) = 25.98, p < 0.001, \Phi = 0.13$ ), and had actually sought help (land-based:  $n = 161$  (40.8%), mixed;  $n = 354$  (32.6%), online:  $n = 40$  (21.7%);  $\chi^2(2, N = 1,666) = 21.23, p < 0.001, \Phi = 0.11$ ) for their gambling problems.

Figure 1 shows the comparison of each subgroup seeking help by level of distress.

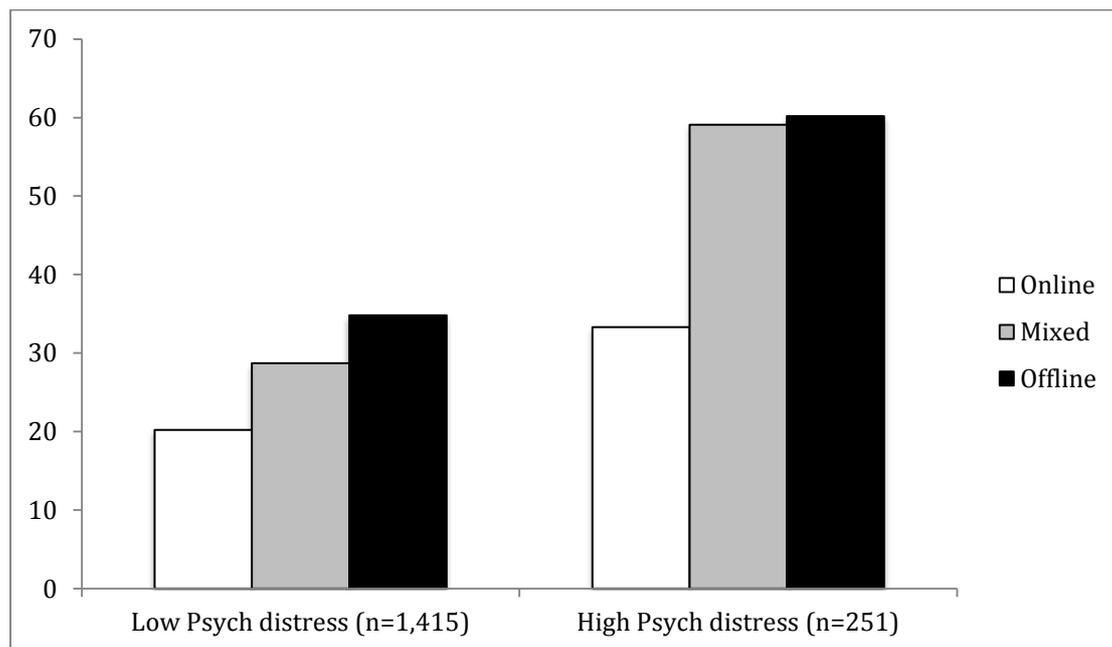


Figure 1 – Proportion of gamblers who have sought help by Kessler 6 groups and gambler subgroups

For those experiencing low levels of psychological distress, a significantly higher proportion of land-based gamblers reported seeking help compared to online gamblers, with the mixed group not significantly different to either online or land-based gamblers,  $\chi^2(2, N = 1,666) = 10.97, p = 0.004, \Phi = 0.09$ . For those experiencing high psychological distress, no such significant differences were observed, most likely because there were relatively few participants experiencing high psychological distress.

A binary logistic regression was run to test the main effects and interactions. Results are shown in Figure 1. The main effect for Kessler 6 group was significant, with a significantly higher proportion of those experiencing high psychological distress seeking help compared to those with lower distress. However, no interaction was significant. This indicated that in terms of help seeking, gamblers with low psychological distress did not differ significantly from the pattern found for those suffering high psychological distress.

For the low psychological distress group, the difference between the proportion of online and land-based gamblers who had sought help is significant, with the mixed gamblers not differing significantly from either group,  $\chi^2(2, N = 1,666) = 10.97, p = 0.004, \Phi = 0.09$ . No significant differences were observed for the high psychological distress group, but fewer participants for that analysis may account for this outcome.

The use of alcohol (coded as 0 = never and 1 = at least sometimes) was also entered into the model, including all interaction terms. The inclusion of this variable did not change any of the above findings. Furthermore, alcohol or any of the interaction terms were not significant predictors of help seeking.

## **Discussion**

The results of this study found a complex and variable pattern of differences in reported negative consequences between online, land-based and mixed mode subgroups of gamblers. Although no characteristic profiles were found to differentiate each group, the findings do challenge the assumption that similar features, patterns of behaviours and negative consequences are representative of all gamblers irrespective of the mode of, or level of, gambling they are engaged in. It is yet to be determined why some of these subgroups experience different degrees and patterns of negative consequences and help-seeking behaviours, and whether or not these are associated with intrapsychic factors or exposure to structural and situational variables inherent in the mode and/or form of gambling.

What does appear to be emerging in the literature is the suggestion that it is the level of involvement in multiple forms of gambling that is associated with a propensity to experience gambling-related harms (LaPlante, Nelson, LaBrie, & Shaffer, 2009; Wardle, Moody, Spence, Orford, Volberg, Jotangia, Griffiths, Hussey, & Dobbie, 2011). Logically, individuals participating in a large number of forms and modes of gambling, particularly electronic gaming machines represent a more involved population of gamblers. The greater the level of involvement, the greater the potential losses sustained, emotional distress and mental health issues experienced.

In the present study, individuals participating in both land-based and Internet gambling exhibited higher scores on the PGSI measure of problem gambling than exclusive land-based or online gamblers. It is most likely that the lower levels of problems among Internet gamblers is accounted for by the lower overall rates of participation in gambling activities compared to land-based gamblers. This interpretation is supported by the studies indicating that Internet gambling was not related to increased risk of gambling problems when other factors including gambling participation were controlled (Philander & MacKay, 2014; Gainsbury, S., Russell, A., Hing, N., Wood, R., Lubman, D. & Blaszczynski, A. (2014). Alternatively, it can be reasonably argued that subpopulations of exclusive Internet gamblers are able to maintain their gambling to more affordable levels perhaps because of lower alcohol consumption rates during gambling, or perhaps more effectively use responsible gambling features to minimise the extent of their losses compared to either mixed or land-based gamblers. In addition, it may well be that factors such as familiarity with the Internet, structure of Internet responsible gambling options, may contribute to lower levels of financial problems compared to the remaining subgroups.

In contrast, gamblers preferring rapid continuous forms in land-based venues, and motivated by emotional vulnerabilities to engage in low skill games (Blaszczynski, & Nower, 2002; Boughton & Brewster, 2002; Grant & Kim, 2002; Ladd & Petry, 2002; Sacco, Torres, Cunningham-Williams, Woods, & Unick, 2011; Walker, Hinch, & Weighill, 2005), may be more likely to bypass responsible gambling options and persist despite losses. Land-based venues may not contain that same capacity as Internet gambling to offer responsible gambling options. For example, setting limits can be more easily achieved on Internet forms where account holders are required to register before play. In contrast, land-based gamblers are not required to register to play and hence, have less or no opportunity to set more than personally determined limits. Similarly, self-exclusion options are more effective in an online environment where detection of breaches is possible to a greater extent as compared to land-based venues.

Gamblers using both land-based and Internet are prone to experience greater levels of loss and hence need for treatment. In support of this contention, online gamblers in this study were significantly more likely to report the absence of gambling related problems compared to the other groups. Although previous research has noted features of online sports and race wagering that are conducive to loss of control over gambling (Hing, Cherney, Gainsbury, Lubman, Wood, & Blaszczynski, 2014), it remains to be determined if there are any specific protective factors of those electing to participate exclusively in online forms. That land-based gamblers were more likely to experience levels of harm prompting individuals to consider and to take steps to seek treatment compared to online and mixed gamblers is somewhat perplexing. It is reasonable to assume that participation in multiple modes would lead to harm that would motivate a gambler to seek treatment. Yet, the mixed gamblers held an intermediary position between the land-based and online gamblers, the latter being less likely to consider a need for treatment. These differences in treatment seeking may also be explained by a younger age mix (youth being less likely to seek treatment) or a overrepresentation of women amongst land-based gamblers, with women more likely to seek treatment for gambling problems compared to men (Ledgerwood et al., 2013; Ledgerwood, Wiedemann, Moore, & Arfken, 2012). Further studies need to elucidate the reasons for such differences in behaviour.

As the demographics of online, mixed and land-based gamblers are not well established, as the data could not be weighted to be representative of the population. Furthermore, the sampling method is likely to bias towards those who use the Internet and thus towards those who gamble on the Internet at least on occasion, so the land-based group may be (more) biased than the online groups.

Nevertheless, the present study suggests that, mixed gamblers, characterised by a younger age, less likely to be in a marital relationship, and more likely to consume alcohol and illicit drugs when gambling, appear to have a propensity to have a greater involvement in gambling and therefore to sustain higher losses and consequent harms. Land-based gamblers, characterized as being older, female and more likely to be divorced, have higher participation in EGMs and table games and higher problem gambling rates than online gamblers. Whether or not online and land-based gamblers continue to expand their regime of gambling and shift to the mixed category is yet to be determined by longitudinal studies.

Longitudinal studies are also needed to unravel causal relationships implicated by the current findings. While mixed mode and land-based gamblers were found to have the highest problem gambling rates and land-based gamblers had the highest levels of psychological distress, evidence is inconclusive as to whether these elevated rates of mental health problems are due to gambling mode, involvement, motivations or preferences, or gambler characteristics.

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