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Title	Gambling and negative life events in a nationally representative sample of UK men
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Publication date	2017-07-14
Original Citation	Roberts, A., Sharman, S., Coid, J., Murphy, R., Bowden-Jones, H., Cowlishaw, S. and Landon, J. (2017) 'Gambling and negative life events in a nationally representative sample of UK men', Addictive Behaviors, 75, pp.95-102. https://doi.org/10.1016/j.addbeh.2017.07.002
Type of publication	Article (peer-reviewed)
Link to publisher's version	10.1016/j.addbeh.2017.07.002
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Download date	2026-11-15 17:34:07
Item downloaded from	https://hdl.handle.net/10468/16167

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Article Word Count: 3510 05th July 2017

Addictive Behaviours

Gambling and negative life events in a nationally representative sample of UK men.

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Total number of manuscript pages: 22

Number of tables: 3

Abstract

Introduction: The links between gambling problems, trauma and life stressors are known to exist but understanding the extent of these relationships will allow for greater efficacy in early intervention and treatment. We investigated these relationships among men and sought to determine whether links were attenuated by alcohol and drug use problems.

Methods: A cross-sectional UK representative general population survey was conducted in 2009 with 3025 men aged 18-64 years. Measurements included self-reported gambling behaviours, as measured by the South Oaks Gambling Scale (SOGS) and traumatic or stressful life events. Covariates included alcohol and drug dependence and socio-demographics. Binary logistic regression models were used to examine associations.

Results: Problem gambling (SOGS 3-4) and probable pathological gambling (SOGS 5+) were associated with increased odds of trauma in childhood (e.g. violence in the home (Adjusted Odd Ratios (AOR) 3.0 (CI =1.8-5.0) and 2.6 (CI =1.7-4.1) respectively), and life stressors in adulthood (e.g. intimate partner violence (AORs 4.5 (CI =2.0-10.3) and 4.7 (CI =2.3-9.7) and homelessness (AORs 2.2 (CI 1.1-4.6) and 3.2 (CI =1.9-5.5)). Results were attenuated when adjusted for probable alcohol and drug dependence with the latter having largest effects.

Conclusions: Among men in the United Kingdom, disordered gambling remains uniquely associated with trauma and life stressors in childhood and adulthood after adjusting for alcohol and drug dependence. The results support a need for disordered gambling treatment services to undertake routine screening for alcohol, drugs, IPV and traumatic life events and to tailor treatment that specifically targets the effects of stress for clients who present with such a cluster of issues.

Keywords: Gambling; Problem gambling; Trauma; Life events; Comorbidity; Substance abuse; Men

1. Introduction.

The increased accessibility of gambling products (Griffiths, Parke, Wood, & Parke, 2006) has coincided with changes in gambling participation and associated harm at a population level (Cowlishaw & Kessler, 2016; Wardle et al., 2011). In Great Britain, approximately 7% of adults are at risk of experiencing harm from their gambling, with 0.7% being classified as problem gamblers (Wardle et al., 2011). Problem and pathological gambling are characterised by persistent maladaptive gambling that leads to social harm and damage to family, personal or recreational pursuits (Delfrabbo, 2013; Lesieur & Rosenthal, 1991). The terminology used to describe problem gambling is variable, with the terms "problem," "pathological" and "compulsive" gambling used interchangeably in the literature (Blaszczynski & Nower, 2002). Gambling was re-classified from an impulse control disorder to a behavioural addiction in the recent version of the Diagnostic Manual of Mental Disorders (American Psychiatric Association, 2013), and renamed under the umbrella term "disordered gambling" in recognition of the similarities between behavioural and substance addictions (Grant, Potenza, Weinstein, & Gorelick, 2010).

Early life stressors, specifically adverse childhood experiences and trauma, increase risk for psychopathology later in life, including the development of disordered gambling (Brydges, Holmes, Harris, Cardinal, & Hall, 2015). Such adverse experiences can include emotional abuse, physical neglect, physical abuse, sexual abuse (Bernstein et al., 1994) and interpersonal trauma (e.g. exposure to interpersonal violence (IPV) or violence in the home) (Catalano, 2013; Romita, Turan, & De Marchi, 2005). Several studies have shown a high incidence of childhood maltreatment, trauma and abuse in disordered gambling groups (e.g., Afifi, Brownridge, MacMillan, & Sareen, 2010; Echeburua, Gonzalez-Ortega, de Corral, & Polo-Lopez, 2011; Hodgins et al., 2010; Kausch, Rugle, & Rowland, 2006; Lane et al., 2016; Petry & Steinberg, 2005; Sharma & Sacco, 2015). While these links are compelling, few studies have considered both traumatic, and stressful life events. As classified in the DSM-IV, traumatic events are exceptionally stressful and emotionally distressing events that are typically unpredictable in nature, distinguished by responses involving intense fear, helplessness and horror (APA, 2013). More general experiences of stressful life events (eg job loss/homelessness) in adulthood are not usually characterised by the same extreme psychological responses (Kausch et al., 2006, Sharma & Sacco, 2015). This distinction is important, since associations with traumatic events might indicate increased vulnerability to developing gambling problems, while associations with other types of stressful life event (e.g. job loss) might indicate consequential harms associated with gambling. Furthermore, there are few studies which have attempted to evaluate when the traumatic or stressful life event occurred. This is notwithstanding that adult (proximal) events may be as relevant as childhood

(distal) events in the development of addiction psychopathology (e.g. Shaffer et al., 2004; Whitesell et al., 2007). In the syndrome model of addiction (Shaffer et al., 2004), for example, it is suggested that multiple determinants, including distal (e.g. genetic, post-traumatic stress disorder) and proximal (e.g. reward value, psychiatric morbidity) events can all influence the likelihood of developing addiction.

Disordered gambling is often co-morbid with other behavioural and psychological disorders, which can exacerbate, or be exacerbated by gambling (e.g. Afifi et al., 2010; Korman et al., 2008; Scherrer et al., 2007). It is recognised that disordered gamblers exhibit elevated levels of a comorbid mental health disorders, with substance related disorders being particularly common. A recent meta-analysis of comorbid disorders in disordered gamblers revealed that the weighted mean effect size for substance use disorders was 57 % (Lorains, Cowlishaw, & Thomas, 2011); and substance use disorders often occur alongside traumatic and stressful live events (e.g. Enoch, 2011; Reynolds et al., 2005). Multiple pathways have been proposed to explain the temporal link between trauma and substance abuse (e.g. Giaconia, Reinherz, Paradis, & Stashwick, 2003). One such explanation is that early traumatic experience may increase the risk of substance use disorders because of efforts to self-medicate or reduce negative mood (Khoury, Tang, Bradley, Cubells, & Ressler, 2010). Surprisingly, given these patterns of comorbidity, few studies have investigated whether substance and alcohol use problems may explain the relationship between disordered gambling and traumatic life events (Echeburua et al., 2011; Korman et al., 2008; Leppink & Grant, 2015; Scherrer et al., 2007; Schluter, Abbott, & Bellringer, 2008).

The aim of this study was to examine the relationship between gambling problems, trauma and life stressors in both childhood and adulthood. The present study is unique in that a nationally representative sample of UK men was used to examine the relationship between the entire spectrum of of gambling behaviours (not just those with severe psychopathology including non-problem gamblers), and the experience of trauma in childhood (distal events) and trauma and life stressors in adulthood (proximal events), while considering the roles that drug and alcohol misuse may play. The paper also sought to extend the findings using the same sample in which self-reports of problem/ pathological gambling were predictive of a range of measures of violent behaviour (Roberts et al., 2016), where gambling remained predictive of a range of measures of violent behaviour after adjusting for alcohol and drug dependence, comorbid mental disorder and impulsivity. However, while the earlier paper examined violent perpetration, the present paper explored IPV and injury from a victim perspective alongside a multitude of variables not considered previously.

More specifically, the present study aimed to: 1) examine the relationship between gambling and traumatic events that may signal vulnerabilities to disordered gambling; 2) examine associations with stressful life events that may signal gambling-related harms (i.e. outcomes of gambling problems); and 3) examine attenuations in associations when controlling for comorbidities (alcohol, drug use) that may indicate potential 'third variable' accounts. It was predicted that gambling problems would be associated with increased levels of trauma and stressors, and that the relationships between disordered gambling, trauma and life stressors would be attenuated when controlling for comorbidities.

2. Material & Methods

2.1 Sample

The study is based on data from the 'Men's Health and Modern Lifestyles Survey' collected in 2009 at Queen Mary, University of London. The sample comprised 3025 men aged 18-64 living in England, Wales and Scotland.

A one-stage survey sought to interview a geo-demographically representative sample of the male population of the UK through a random location methodological approach. Random location techniques utilise a full selection of geographic areas to be visited by interviewers, allied to quota sheets showing exactly whom they must approach and interview within their target geography. This procedure necessitated the use of profiling statistics from the then most up-to-date Census (2001). Within each Government Office Region, all Output Areas (OA) (averaging 150 households, and about which all demographic profiling information is known) were selected and listed in descending order of CACI (2012) type to place the most affluent OAs at the top of the list and the least affluent at the bottom. This applies a purely random variable into the selection of sampling locations. The total number of eligible male adults in each OA were then cumulated down the list. Using a random start and fixed sampling interval the required number of OAs were selected. This process produces a sample of OAs with a probability of selection proportionate to size and was designed to produce a representative sample by ACORN type.

A total of 250 OAs were selected, with interviewers required to achieve 12 interviews with eligible targets at each. All addresses that lay within selected OAs were potentially available for interview. With OA information cross-referenced against full address lists, interviewers were supplied with every single address that was eligible within each OA. A quota sheet was provided for each selected OA, which reflected the actual composition of eligible residents according to standard demographic criteria. These would include socio-demographic characteristics such as gender, ethnicity and working status (in addition to age). Interviewers

were required to interview a sample profile that exactly matched that of the eligible OA population profile using the then up-to-date ONS population estimates information. This ensured that the sample was demographically representative at the micro-level, as well as geographically representative of males in the general population. If a participant refused to fill out the questionnaire (approximately 23% of all participants approached), or was absent, another was located in the area with exactly the same demographic profile (age and social class) until the quota was filled.

The statistical reliability of this approach depended both on strictly defining the selection of the sampling points, as well as in setting representative quotas at each point, and then meticulously meeting these quotas. Compliance with this procedure produced a fully representative dataset. Self-report questionnaires were administered at home, with the respondent left to complete the questionnaire in their own time. The researcher either returned later that day, or the next. Each questionnaire took approximately 45 minutes to complete. Participants were given £5 on completion of the questionnaire.

Study design and procedures were approved by the Queen Mary, University of London Human Research Ethics Committee. For full details and ages and demographic details of subjects interviewed, see Roberts et al., (2016). Study design and procedures were approved by the Queen Mary, University of London Human Research Ethics Committee.

2.2 Survey Measures

2.2.1 Dependent Measures

Problem/pathological gambling

Gambling problems were determined by using The South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987), a 20-item measure based on the Diagnostic and Statistical Manual of Mental Disorder criteria for pathological gambling (APA, 2000). SOGS scores can range from 0-20, and originally the authors distinguished scores of 0 (no problem) from 1-4 (some problem), and scores of 5 or more (probable pathological gambling) (Lesieur & Blume, 1987). In the current study, in line with later suggestions (e.g. Dubé, Freeston & Ladouceur, 1996; Volberg and Steadman, 1988) and to highlight the 'spectrum' of gambling severity: those with scores of 1-2 were given the designation “borderline problem gambler”, those with scores of 3 and 4 “problem gamblers” and those with scores of 5 or more “probable pathological gamblers”. Those with SOGS scores of 0 were combined with the Non-Gambling Group (Non/non-problem gamblers) and used as the reference category in all the analyses. The

SOGS has been found to have satisfactory reliability with coefficient alphas of .69 and .86 in the general population and gambling treatment samples, respectively (Stinchfield, 2002).

Trauma and life stressors

Participants were asked questions about their experience of trauma before the age of 18 (childhood), specifically whether they had witnessed their parents or carers fighting/ violence in the home, had been subjected to physical or sexual abuse/ assault as a child, or had received a serious injury (dichotomous yes/ no answers). Questions were also asked about trauma and life stressors after the age of 18 (adulthood), including whether they had experienced physical attack resulting in injury, violence at home from a partner or in the workplace, or had experienced any other life stressor such as; relationship breakdown, job loss, homelessness, money problems or convictions. Similar questions have been used in previous large-scale national surveys (Coid et al., 2006).

2.2.2 Covariates

Sociodemographic Covariates

Sociodemographic measures used in the regression models (categorisation in parentheses) included; Age (18-24, 25-34, 35-44, 45-54, 55-64); marital status (single, married, separated/ divorced/ widowed, couple); education (degree level or above, 'A-Level' or equivalent, 'GCSE' or other, none); annual income (Less than £10,000, £10,000-£19,999, £20,000-£29,999, £30,000-£39,999, £40,000+); area (rural, semi-urban, other urban, inner city); employment status (employed, unemployed); and ethnicity (white, minority ethnicity).

Probable alcohol dependence

The principal instrument to assess alcohol misuse was the Alcohol Use Disorders Identification Test (AUDIT) (Babor, Biddle-Higgins, Saunders, & Monteiro, 2001). The AUDIT consists of 10 questions, each scored from 0-4 with an overall score ranging from 0 to 40. Scores of 20 or more indicate alcohol dependence. The scale has a good median reliability coefficient of 0.83 (Reinert & Allen, 2007).

Probable drug dependence

The Drug Use Disorders Identification Test (DUDIT) was used to identify drug problems (Berman, Bergman, Palmstierna, & Schlyter, 2005). The DUDIT consists of an 11-item self-report questionnaire, which looks at frequency and harms of drug use. A cut-off score of ≥ 25 indicates drug-dependence. The DUDIT has been found to have good reliability with a coefficient alpha of 0.80 (Berman et al., 2005).

2.3 Data analysis

The data were analysed using the Statistical Package for the Social Sciences (SPSS) 22.0. Binary Logistic regression was used to examine the relationships between gambling and psychiatric correlates used in our later analyses (table 1). Here associations were adjusted by age, marital status, education, income, area and ethnicity. In table 2, binary logistic regression was used to examine relationships and estimate differences in trauma and life stressors per gambling group. Dummy variables indicating the gambling problem categories were specified as independent / exogenous variables in these analyses. Different combinations of covariates were entered into the analysis to estimate the independent impact of these characteristics on the gambling-trauma relationship. There were 4 stages to the regression analyses; in the first model, all associations were adjusted by age, marital status, education, income, area and ethnicity (AOR-1: Adjusted Odds Ratio); in the second model, associations were adjusted for demographic covariates and probable alcohol dependence (AOR-2); in the third model, associations were adjusted with demographic covariates and probable drug dependence (AOR-3); in the fourth model, associations were adjusted with the demographic covariates, probable alcohol and drug dependence combined (AOR-4). A significance level of 5% was adopted for all analyses.

3. Results

In our sample of 3025 men, 2418 (79.9%) had taken part in some form of lifetime gambling activity. Of the men who gamble, 64.3% were non-problem gamblers (SOGS 0), 21.6% were borderline problem gamblers (SOGS 1-2), 6.0% problem gamblers (SOGS 3-4) and 8.1% probable pathological gamblers (SOGS 5+).

The relationships between gambling and probable drug and alcohol dependence are presented in Table 1. There was a marked difference between pathological gamblers, problem gamblers and non/non-problem gamblers in relation to psychopathology. Both probable pathological gamblers and problem gamblers were significantly more likely to exhibit probable alcohol dependence, and probable drug dependence, when compared to non/non-problem gamblers. Borderline problem gamblers had a more modest but still statistically significant increase in the chance of probable drug and alcohol dependence, relative to non/non-problem gamblers.

Table 1

Table 2 shows associations involving gambling group and experiences of traumatic life events. After adjusting for demography, problem/pathological gambling was associated with increased odds of having witnessed violence in the home as a child. Moreover, probable pathological gambling (but not problem gambling) was associated with increased odds of physical abuse and a serious or life threatening injury in childhood. Borderline problem gamblers exhibited increased odds of physical abuse and assault compared to non-problem gamblers. In adulthood, problem/pathological gambling was associated with increased odds of traumatic events including injury from physical attack, interpersonal violence in the home, as well as violence in the workplace. Borderline problem gambling was associated with a significantly increased odds of being injured compared to non/non-problem gamblers.

Table 2 also shows associations with gambling groups and the broader category of stressful life events. Results indicated that probable pathological gambling was associated with significantly increased odds of all stressful events including marital difficulties or breakdown, job loss, homelessness, serious money problems, and criminal convictions. Problem gambling was significantly associated with all such life events except job loss. Borderline problem gambling was significantly associated with relationship problems and criminality, compared to non/non-problem gamblers, along with serious money problems.

Table 2

Table 3 shows comparable associations involving gambling group, trauma and life stressors, while including probable alcohol and drug dependence as covariates. Results indicated that associations were generally attenuated with inclusion of covariates, with probable drug dependence having largest effects overall. Witnessing violence in the home as a child and domestic violence in home as an adult were the only variables to retain statistical significance in all the fully adjusted models in problem and probable pathological gamblers. Significant links remained with violence in the workplace, and being convicted of criminal offence (for problem gamblers), and marital problems and money problems (for pathological gamblers) after adjustments. Associations retained significance more in probable pathological gamblers compared to the other groups.

Table 3

4. Discussion

This study adds to evidence showing a relationship between problem/pathological gambling, trauma and stressful life events (e.g. Afifi et al., 2010; Echebura et al., 2011; Hodgins et al., 2010; Kausch et al., 2006; Petry & Steinberg, 2005; Scherrer et al., 2007). The study was

unique given the use of a large nationally representative sample of UK men to examine relationships involving gambling problems and violence, trauma and life stressors in both childhood and adulthood, while also considering roles of probable drug and alcohol dependence. The findings built on previous research in which gambling remained predictive of a range of measures of violent behaviour after adjusting for alcohol and drug dependence, comorbid mental disorder and impulsivity (Roberts et al., 2016).

The results indicated that male probable pathological gamblers and problem gamblers reported higher rates of experiencing trauma in both childhood and adulthood. Trauma included witnessing violence in the home, physical abuse, sexual abuse or IPV in adulthood, and violence at work. Previous studies have also suggested a high incidence of childhood victimisation/abuse and adult trauma in disordered gambling groups (Afifi et al., 2010; Korman et al., 2008). Although links between trauma and disordered gambling are equivocal, it has been postulated that trauma may be causally related to occurrences of disordered gambling, with some people using gambling to escape negative emotional states (Grant & Kim, 2002; Legerwood & Petry, 2006; MacLaren, Ellery, & Knoll, 2015; Suomi, Dowling, & Jackson, 2014; Wood & Griffiths, 2007). Victims of family violence and trauma, in particular, may use gambling as a coping mechanism (Afifi et al., 2010; Cunningham-Williams, Abdallah, Callahan & Cottler, 2007; Korman et al., 2008), and a method of regulating mood (Francis, Dowling Jackson, Christensen, & Wardle, 2015). Some evidence suggests that women in particular use gambling in this way (e.g. Echeburua et al., 2011; Weatherly & Cookman, 2014) and the present findings suggest that this exposition can be extended to a subgroup of males in a nationally representative sample. The present findings suggest that trauma may precede and facilitate the development of disordered gambling as a way to escape either physically or emotionally.

Probable pathological gamblers and problem gamblers reported injuries, marital difficulties, homelessness, money problems and criminality more often than non/non-problem gamblers. Daily stressors have been linked with spontaneous urges to gamble among pathological gamblers (Elman, Tschibelu, & Borsook, 2010) and may thus trigger gambling episodes. Further, people experiencing gambling problems are often able to identify events and stressors that precede increased gambling (Holdsworth, Nuske, & Hing, 2013). Life stressors include legal problems (Hodgins, Peden & Cassidy, 2005), financial difficulties (Kalischuk, Nowatzki, Cardwell, Klein, & Solowoniuk, 2006), relationship problems (Downs and Woolrych, 2010), and housing concerns (Lipmann, Mirabelli, & Rota-Bartelink, 2004). It is also likely that occurrences of some stressful life events follow gambling problems may signal further or perhaps ongoing likely gambling-related harms and further gambling events. While previous

studies have referred to certain gambling related harms (e.g. relationship problems, money problems, and criminal difficulties) and gambling problems (Dowling, Smith, & Thomas, 2009; Ladouceur, Boisvert, Pépin, Loranger, & Sylvain, 1994), few studies have provided evidence to support this assumption. Both significant life events and disordered gambling can be interrelated and have been linked to similar issues including legal and financial difficulties, relationship problems, and employment-related concerns (Holdsworth et al., 2013). Further research is still needed to determine if adult stressors are a trigger or a consequence of disordered gambling, although our findings do accentuate the possibility of a self-perpetuating cycle.

Probable alcohol and drug dependence was reported by around a third of pathological gamblers, consistent with high rates of comorbidity shown previously (Lorains et al., 2011). In the present study, the associations involving gambling problems and trauma were generally attenuated when adjustments were made for 'third variable accounts'; alcohol or drug dependence. Although witnessing violence in the home as a child, domestic violence in home as an adult, violence in the workplace and some potential "harms" such as being convicted of a criminal offence, marital problems and money problems remained significant in some or all groups after adjustments. Afifi et al., (2010) reported similar results, although they did not focus exclusively on males and further research is needed to establish directionality and possible causal mechanisms. Certain associations with life stressors that were initially significant were attenuated entirely when adjustments were made for alcohol / drug use problems which suggests that these comorbidities may entirely explain this link (e.g. homelessness).

Taken as a whole, this suggests that disordered gambling does not occur in a vacuum, rather it is perhaps symptomatic of a more global disturbance in the biopsychosocial functioning of some individuals. This could be interpreted as consistent with the latter of the two pathways described by Blaszczynski and Nower (2002) in the Pathways Model, or to some degree the model described by Jacobs (1986) which has been supported elsewhere (e.g., Gupta & Derevensky, 1998; McCormick et al., 2012). It would seem likely that there is a more fundamental process underlying this, with the effects of significant trauma being important. Developing understanding of complex gene-environment interactions resulting in an increased or differential susceptibility to environmental stressors (e.g., Belsky & Pluess, 2009; Monroe & Simmons, 1991; Zuckerman, 1999) is likely to be a significant focus of future research when looking at ways to prevent harm and identifying where to place greater resources at population level. In the interim, more research is required examining specific pathways and risk factors contributing to disordered gambling, and addictive behaviours more generally. It is clear that

treatments should be developed which are specific for problem gamblers with distinct vulnerabilities; whether these are a history of trauma, comorbid substance abuse or where gambling is motivated by escape or used as a maladaptive coping strategy to deal with psychological difficulties (Legerwood & Petry, 2006; McCormick, Delfabbro, & Denson, 2012; Wood & Griffiths, 2007).

Our survey was not without limitations and these should be considered when interpreting the findings. They have been described elsewhere (Roberts et al., 2016) and include the use of retrospective, cross-sectional and self-report data and the SOGS as a population tool (Lesieur and Blume, 1987). The data were collected in 2009 and are now 7 years old and results may not be relevant to other countries/ cultures. Violence was assessed by self-report and did not include corroborative data on specific arrests and/or convictions. The SOGS (Lesieur & Blume, 1987) was designed as a clinical scale, and despite being widely used in population surveys (e.g. Volberg & Steadman 1988), there are other scales such as the Problem Gambling Severity Index (Ferris & Wynne, 2001) that were specifically designed for population level work. Researchers have used a variety of scales, and caution is required when directly comparing prevalence rates. Although a relationship between trauma, life stressors and disordered gambling is evident, the study cannot address whether adversity is the direct cause of disordered gambling. Longitudinal data may be required to fully comprehend the mechanisms underlying this link.

5. Conclusions

The findings add support to previous literature that shows a link between trauma, life stressors and disordered gambling. The study was unique and addressed a gap in the literature by using a nationally representative sample of UK men. Furthermore, although stressful life events can be subsumed by notions of gambling-related harms, there are few rigorous studies that have demonstrated these links empirically. Thus, our findings are important in terms of demonstrating the public health impact and context of gambling problems. Understanding the developmental precursors to disordered gambling; specifically, the relationship between disordered gambling and trauma, will assist in the development of more effective early intervention and treatment initiatives; in the latter, an improved understanding would impact on case conceptualisation and treatment complexity. Public health initiatives could also include information about and support of adaptive coping strategies to those exposed to early trauma, especially violence and those with comorbid substance and gambling problems due to increased vulnerability. Moreover, disordered gambling precursors and the harms of gambling (i.e. life stressors) may signal further clinical needs and an improved knowledge of these may help the identification of those who may be at risk for stress-related relapse or

escalation. The evidence supports a need for disordered gambling treatment services to undertake routine screening for alcohol, drugs, IPV and traumatic life events and to tailor treatment that specifically target the effects of stress for clients who present with such a cluster of issues. There is also a need for other services as such as drug and alcohol and other mental health services to routinely screen for gambling, trauma and adverse life events.

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Table 1: Adjusted odds ratio estimates for gambling and probable alcohol and drug dependence.

	Total	Non-Gambler/ Non-Problem Gambler (N=2144) (SOGS 0)		Borderline Problem Gambler (N=523) (SOGS 1-2)		Problem Gambler (N=144) (SOGS 3-4)		Probable Pathological Gambler (N=197) (SOGS 5+)	
	% n	% (n)	AOR	% (n)	AOR (CI)	% (n)	AOR (CI)	% (n)	AOR (CI)
Probable alcohol dependence	8.0 (243)	4.5 (96)	1	7.8 (41)	1.8** (1.19-2.85)	18.1 (26)	3.4*** (1.83-6.44)	37.6 (74)	10.1*** (6.38-15.87)
Probable drug dependence	10.3 (313)	7.5 (160)	1	12.8 (67)	1.9** (1.32-2.75)	19.4 (28)	3.6*** (2.08-6.29)	29.4 (58)	5.0*** (3.15-8.06)

Adjusted Odds Ratios (AOR) adjusted for age, marital status, education, income, area, and ethnicity.

Reference: Non/Non-problem gambler ***P≤ 0.05; ** P≤ 0.01; *** P≤ 0.001**

Table 2: Independent associations between gambling, trauma and life stressors

	Non-Gambler/ Non-Problem Gambler (N=2144) (SOGS 0)		Borderline Problem Gambler (N=523) (SOGS 1-2)		Problem Gambler (N=144) (SOGS 3-4)		Probable Pathological Gambler (N=197) (SOGS 5+)	
	% (n)	AOR	% (n)	AOR (CI)	% (n)	AOR (CI)	% (n)	AOR (CI)
Traumatic Events-Childhood								
Witnessing violence in home	7.9 (170)	1	11.1 (58)	1.3 (0.92-1.93)	22.9 (33)	3.0*** (1.80-5.00)	25.4 (50)	2.6*** (1.70-4.08)
Physical abuse/ assault	3.6 (77)	1	7.1 (37)	1.7* (1.1-2.79)	9.7 (14)	2.0 (0.98-4.26)	10.1 (20)	2.1* (1.17-3.93)
Sexual abuse	1.9 (40)	1	2.1 (11)	1.1 (0.53-2.62)	2.7 (4)	2.2 (0.75-6.48)	3.0 (6)	2.5 (0.99-6.29)
Serious/life threatening injury	1.8 (39)	1	1.9 (10)	0.8 (0.37-1.99)	2.7 (4)	0.4 (0.05-3.13)	7.6 (15)	3.5*** (1.70-7.30)
Traumatic Events-Adulthood								
Being injured as a result of physical attack	14.2 (304)	1	24.7 (129)	1.8*** (1.42-2.43)	25.0 (36)	2.1*** (1.39-3.45)	30.5 (60)	2.0*** (1.41-3.09)
Domestic violence in home from a partner	1.8 (38)	1	2.9 (15)	1.6 (0.85-3.33)	6.3 (9)	4.5*** (2.00-10.32)	8.6 (17)	4.7*** (2.31-9.70)
Violence in the workplace	1.4 (30)	1	2.7 (14)	1.7 (0.79-3.81)	5.6 (8)	5.5*** (2.29-13.68)	4.1 (8)	2.9* (0.88-8.31)
Stressful Life Events-Adulthood								
Separation-marital difficulties/ breakdown of steady relationship	10.3 (243)	1	14.9 (78)	1.7*** (1.25-2.42)	16.0 (23)	1.8* (1.00-3.31)	19.3 (38)	2.8*** (1.80-4.40)
Job Loss	18.6 (399)	1	20.8 (109)	1.1 (0.87-1.54)	18.0 (26)	1.1 (0.67-1.86)	26.9 (53)	1.6* (1.11-2.46)
Being homeless	4.5 (97)	1	6.7 (35)	1.4 (0.85-2.31)	11.8 (17)	2.2* (1.11-4.64)	15.2 (30)	3.2*** (1.94-5.54)
Serious money problems	12.8 (274)	1	16.1 (84)	1.3* (1.01-1.86)	24.3 (35)	2.1** (1.33-3.49)	35.6 (70)	3.3*** (2.25-4.86)
Convicted criminal offence	9.3 (200)	1	14.9 (78)	1.5*** (1.14-2.22)	22.9 (33)	3.0*** (1.86-5.09)	29.4 (58)	2.7*** (1.77-4.17)

Adjusted Odds Ratios (AOR-1) adjusted for age, marital status, education, income, area, and ethnicity.
Reference: Non/Non-problem gambler ***P≤ 0.05; ** P≤ 0.01; *** P≤ 0.001**

Table 3: Independent associations between gambling, trauma and life stressors with alcohol and drug dependence as covariates

	Non-Gambler/ Non-Problem Gambler (N=2144) (SOGS 0)		Borderline Problem Gambler (N=523) (SOGS 1-2)				Problem Gambler (N=144) (SOGS 3-4)				Probable Pathological Gambler (N=197) (SOGS 5+)			
	% (n)	AOR	% (n)	AOR-2 (CI)	AOR-3 (CI)	AOR-4 (CI)	% (n)	AOR-2 (CI)	AOR-3 (CI)	AOR-4 (CI)	% (n)	AOR-2 (CI)	AOR-3 (CI)	AOR-4 (CI)
Traumatic Events- Childhood														
Witnessing violence in home	7.9 (170)	1	11.1 (58)	1.1 (0.76-1.76)	1.2 (0.81-1.93)	1.2 (0.8-2.03)	22.9 (33)	2.2* (1.24-4.20)	2.6*** (1.46-4.72)	2.1* (1.10-4.23)	25.4 (50)	2.3** (1.41-3.79)	2.1** (1.28-3.64)	2.0* (1.12-3.57)
Physical abuse/ assault	3.6 (77)	1	7.1 (37)	1.4 (0.85-2.85)	1.7 (0.99-3.07)	1.6 (0.83-3.08)	9.7 (14)	1.9 (0.82-4.51)	2.5* (1.16-5.56)	2.4 (0.99-5.90)	10.1 (20)	1.6 (0.80-3.29)	2.1* (1.04-4.45)	1.7 (0.75-3.90)
Sexual abuse	1.9 (40)	1	2.1 (11)	1 (0.42-2.71)	1 (0.42-2.76)	1.2 (0.42-3.38)	2.7 (4)	2.6* (0.84-8.29)	2.0 (0.66-6.65)	2.8 (0.88-9.51)	3.0 (6)	1.5 (0.51-4.60)	2.6 (0.98-7.25)	1.6 (0.51-5.51)
Serious/life threatening injury	1.8 (39)	1	1.9 (10)	0.7 (0.28-2.03)	0.6 (0.25-1.86)	0.7 (0.25-2.39)	2.7 (4)	0.5 (0.06-3.64)	0 (0-0)	0 (0-0)	7.6 (15)	2.6* (1.12-6.42)	3.3** (1.45-7.56)	2.6 (0.97-7.44)
Traumatic Events- Adulthood														
Being injured as a result of physical attack	14.2 (304)	1	24.7 (129)	1.8*** (1.39-2.5)	1.9*** (1.42-2.57)	1.8*** (1.35-2.58)	25.0 (36)	1.7* (1.05-3.00)	1.6 (0.98-2.80)	1.2 (0.71-2.35)	30.5 (60)	1.8** (1.19-2.88)	1.6* (1.04-2.62)	1.4 (0.90-2.48)
Domestic violence in home from a partner	1.8 (38)	1	2.9 (15)	1.2 (0.54-2.82)	1.5 (0.71-3.52)	1.5 (0.64-3.9)	6.3 (9)	5.2*** (2.19-12.57)	3.5** (1.39-8.96)	5.1** (1.98-13.56)	8.6 (17)	3.0** (1.3-6.89)	4.3*** (1.93-9.59)	3.0* (1.22-7.75)
Violence in the workplace	1.4 (30)	1	2.7 (14)	1.5 (0.60-4.05)	2.2 (0.95-5.41)	2.0 (0.68-5.85)	5.6 (8)	5.4** (1.87-15.9)	5.2** (1.78-15.39)	4.7* (1.22-18.43)	4.1(8)	3.2* (1.05-10.25)	1.5 (0.34-7.27)	2.1 (0.42-11)
Stressful Life Events- Adulthood														
Separation-marital difficulties/breakdown of steady relationship	10.3 (243)	1	14.9 (78)	1.5* (1.04-2.19)	1.7** (1.19-2.46)	1.5* (1.01-2.28)	16.0 (23)	1.3 (0.68-2.72)	1.2 (0.64-2.42)	0.9 (0.44-2.10)	19.3 (38)	2.2** (1.37-3.77)	2.5*** (1.54-4.22)	2.1** (1.22-3.7)
Job Loss	18.6 (399)	1	20.8 (109)	1.1 (0.8-1.51)	1.0 (0.78-1.48)	1.0 (0.76-1.51)	18.0 (26)	0.8 (0.48-1.63)	0.8 (0.48-1.53)	0.6 (0.3-1.26)	26.9 (53)	1.8** (1.16-2.83)	1.4 (0.93-2.34)	1.6* (0.99-2.68)
Being homeless	4.5 (97)	1	6.7 (35)	1 (1.58-1.9)	1.0 (0.52-1.91)	0.8 (0.41-1.81)	11.8 (17)	1.1 (0.47-3.03)	0.9 (0.35-2.66)	0.3 (0.08-1.75)	15.2 (30)	1.6 (0.86-3.1)	2.5** (1.36-4.95)	1.6 (0.77-3.49)
Serious money problems	12.8 (274)	1	16.1 (84)	1.3 (0.97-1.9)	1.3 (0.94-1.88)	1.4 (0.99-2.06)	24.3 (35)	1.9** (1.10-3.31)	1.5 (0.91-2.76)	1.4 (0.80-2.77)	35.6 (70)	2.9*** (1.88-4.53)	2.8*** (1.78-4.39)	2.5*** (1.56-4.23)
Convicted criminal offence	9.3 (200)	1	14.9 (78)	1.5* (1.03-2.17)	1.3 (0.93-2.04)	1.3 (0.88-2.10)	22.9 (33)	3.2*** (1.81-5.64)	2.4** (1.33-4.33)	2.8** (1.51-5.43)	29.4 (58)	1.9** (1.18-3.16)	1.7* (1.03-2.94)	1.2 (0.7-2.35)

Adjusted Odds Ratio (AOR-2): adjusted for age, marital status, education, income, area, ethnicity and probable alcohol dependence. Reference: Non/Non-problem gambler ***P≤ 0.05; ** P≤ 0.01; *** P≤ 0.001**

Adjusted Odds Ratio (AOR-3): adjusted for age, marital status, education, income, area, ethnicity and probable drug dependence.

Adjusted Odds Ratio (AOR-4): adjusted for age, marital status, education, income, area, ethnicity, probable drug and alcohol dependence.