Gambling problems among United Kingdom armed forces veterans: Associations with gambling motivation and posttraumatic stress disorder

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# Abstract

Military veterans have heightened vulnerability to problem gambling. Little is known about risk factors for problem gambling among United Kingdom (UK) Armed Forces (AF) veterans. We examined the associations between sociodemographic characteristics, military service, mental health, and gambling activities and motivations as predictors of problem gambling in a sample of UK AF veterans. Age-and-gender matched samples of veterans (*n*=1,037) and non-veterans (*n*=1,148) completed an online survey of problem gambling, gambling motivation, mental health (depression and anxiety), and posttraumatic stress disorder (PTSD). Past year problem gambling rates were higher in veterans compared to non-veterans. Veteran status predicted increased problem gambling risk. The relationship between problem gambling and gambling to cope with distress was significantly stronger among veterans. Veterans experiencing PTSD and complex PTSD (C-PTSD) were at increased risk of problem gambling. Overall, the present, large sample-size survey of UK AF veterans contributes further international evidence that veterans are a population vulnerable to problem gambling. Veterans with PTSD or C-PTSD are most at-risk and may engage in problematic gambling to escape/avoid distress. Routine screening for gambling problems should be undertaken with current and former military personnel, and further research is needed on the interplay between gambling motivation and veterans’ mental health.

*Keywords*: gambling; veterans; mental health; trauma; motivation; escape/avoidance

# Introduction

Gambling is an addictive behaviour characterised by recurrent, problematic patterns of gambling leading to significant harm across several life domains (American Psychiatric Association, 2013). Gambling problems often fall along a continuum from clinically significant levels of severity ranging from what is termed, ‘problem gambling’, to subclinical, problematic behaviours involving some degree of harm referred to as ‘low-risk’, ‘moderate-risk’, or ‘at-risk gambling’ (Wardle et al., 2019).

Increasing evidence highlights vulnerable populations at heightened risk of gambling problems such as currently serving military personnel (Cowlishaw et al., 2020; van der Maas & Nower, 2021) and Armed Forces (AF) veterans (Etuk et al., 2020; Sharman et al., 2019). International rates of lifetime problem gambling in veterans from jurisdictions with different gambling environments such as the United States of America (USA), United Kingdom (UK), and Australia range between 2% and 29%, considerably higher than the general population (Etuk et al., 2020; Levy & Tracy, 2018; Paterson et al., 2021; van der Maas & Nower, 2021). Analysis of a large national household survey dataset (the *Adult Psychiatric Morbidity Survey 2007*) from the UKidentified that community-dwelling veterans were up to 8 times more likely to experience problem gambling than non-veterans (Dighton et al., 2018; Roberts et al., 2019). This relationship was not explained by differences in mental health conditions, substance use, or financial management.

While the availability of differing opportunities to gamble is likely to impact estimated rates of problem gambling, such problems frequently co-occur with common mental health disorders that disproportionately affect veterans relative to non-veterans (Ahern et al., 2015; Freeman et al., 2020). Despite this, research on the associations between the heightened prevalence of gambling problems and mental health disorders in veterans is limited (Etuk et al., 2020; Levy & Tracy, 2018). Gambling problems are associated with depression and anxiety, with 41% of veterans seeking treatment for gambling also reporting a lifetime history of mood disorders (Shirk et al., 2018). Indicators from a longitudinal study of data from the US Department of Defense Health Behavior Survey (1980–2008) revealed increased rates of poor mental health and suicide attempts in active service personnel (Bray et al., 2010). Moreover, gambling is related to substance misuse in veterans, with 79% of veterans attending treatment for substance misuse reporting ‘cravings’ to gamble and 27% reporting life problems due to their gambling (Davis et al., 2017). In a US-based sample of veterans seeking treatment for gambling problems, 66.4% reported substance use or dependence across their lifetime (Kausch, 2003). Although the association between the two is well known, the causal direction between substance use and gambling in veterans has been minimally analysed. Thus, the associations and interactions between mental health, substance use, and gambling among veterans warrant further investigation (Etuk et al., 2020; Levy & Tracy, 2018).

The relationship between trauma and gambling problems in veterans is similarly unclear. Although gamblers among the general population may be more likely to have a diagnosis of posttraumatic stress disorder (PTSD) (Moore & Grubbs, 2021), Westermeyer et al. (2018) found no association between gambling severity and combat exposure. Recent research identified salient associations between a history of physical or sexual trauma and severity of gambling in a large sample of veterans (Stefanovics et al., 2017). Given the changing nature of military involvement, differences between UK and US AF in levels of combat engagement in recent conflicts (Hoge et al., 2014) and culture and organisation (Hoptopf et al., 2016) leading to wide variances in PTSD rates in samples of veterans between the two countries, analysis of the association between PTSD and gambling among UK AF veterans is pertinent. Moreover, evidence suggests that International Classification of Diseases (ICD)-11 complex PTSD (C-PTSD) is more common than PTSD among UK help-seeking veterans (Murphy et al., 2021). The ICD-11 diagnostic criteria for PTSD include re-experiencing trauma, engaging in avoidance, and a current sense of threat. To meet criteria for potential C-PTSD, additional disturbances in self-organization within related symptom clusters of affective dysregulation, negative self-concept, and disturbances in relationships must be evident (Brewin et al., 2017; Wolf et al., 2015). Veterans screened for symptoms indicating potential C-PTSD are more likely to experience greater levels of childhood adversity prior to enrolment and increased bullying during service, as well as elevated levels of comorbid mental health difficulties and greater social isolation on leaving the services. The respective impact of PTSD and C-PTSD risk factors and their comorbidity on vulnerability to problem gambling among veterans, however, remains underexamined.

Identifying the factors motivating veterans’ gambling is crucial in understanding the co-occurrence of mental health difficulties (Stewart et al., 2016). Gambling may be motivated by factors such as to practice or learn the game, to feel competent at an objective, to experience excitement, to socialise with peers and others, to feel important, to win money, and to continue to gamble with no objective (Chantal et al., 1994). Understanding gambling motivation may aid in determining the persistence and resulting severity of gambling related problems among veterans (Grubbs et al., 2018). Drawn from research on operant conditioning, studies employing versions of the Gambling Functional Assessment (GFA; Dixon et al., 2018; Miller et al., 2009; Weatherly et al., 2011, 2014) found different motives in the maintenance of gambling. These include social attention (e.g., interacting with peers) and accessing tangible rewards (e.g., vouchers or competitions) that capture the social and non-social positive reinforcement motivations, while sensory experiences (e.g., enjoying the lights and sounds, or feeling an emotional rush), and psychological/physical escape (e.g., leaving/distracting from a difficult work/home environment) capture the negative reinforcement motivations of gambling. Crucially, negative reinforcement is thought to represent the function most likely to maintain problem gambling (Dixon et al., 2018). To date, no study has investigated gambling motivation in veterans.

Interestingly, gambling motivated as a form of escape/avoidance-based coping mechanism is highlighted through findings linking PTSD and gambling (Grubbs et al., 2018; Moore & Grubbs, 2021). Coping motivations for gambling and positive gambling outcome expectations are elevated in those experiencing PTSD symptoms, both in treatment-seeking samples and online convenience samples (Grubbs et al., 2019). While little is currently known about the possible factors maintaining gambling in veterans, how individuals respond to stress is a significant factor in the gambling behaviour of the general population (Buchanan et al., 2020). Gambling is often used as a coping mechanism to deal with stress, yet the consequences of problematic gambling may also come to act as stressors, leading to a feedback loop accentuated by stress-induced loss-chasing that may become exacerbated by a blunted physiological reaction to stress as the behaviour becomes established (Buchanan et al., 2020). Moreover, family experience and living arrangements contribute to early exposure and provide a motive to escape through gambling (Allami et al., 2021; Subramaniam et al., 2017), with veterans with family members engaged in gambling having higher likelihood of increased gambling (Freeman et al., 2020).

At present, little is known about the prevalence of gambling problems among UK veterans. The preliminary findings of Dighton et al. (2018) and Roberts et al. (2019) involved small numbers of veterans living in England and utilised data obtained over fifteen years ago. As such, a contemporary survey is required that addresses these limitations and reflects both the changing nature of being a member of the AF and the evolving, increasingly online, gambling landscape. The aim of this paper is to describe the findings of a survey designed to investigate sociodemographic, military service, mental health, and gambling activities and motivation variables as predictors of problem gambling among a large sample of UK veterans.

# Materials and Method

## Participants and Ethics

For the veterans’ sample, participants were recruited primarily online to the ‘UK AF Veterans’ Health and Gambling Study’ using digital marketing-based methods (e.g., targeted adverts on Facebook). Recruitment emails were also circulated by National Health Service (NHS) veterans’ services and charities. Prolific, an online research participation platform, was used to target an age- and gender matched non-veteran sample on completion of recruitment for the veteran sample. In total, 5,147 responses were received to the online survey (2,535 veterans and 2,612 non-veterans). To ensure data integrity, quality control measures were applied to screen for and remove the following responses from the veteran sample: (a) opened the survey but did not complete any of the measures (11.1%); (b) did not complete the consent form (3.4%); (c) did not meet the threshold of completion of measures to be included in the dataset (19%); (d) did not provide legitimate military service credentials (23.3%); (e) did not meet the inclusion criteria of being at least 18 years old and having served in the UK Armed Forces (2.1%). For the non-veteran sample, the following screening measures were applied: (a) opened the survey but did not complete any of the measures (23.4%); (b) did not complete the consent form (1.9%); (c) did not meet the threshold of completion of measures to be included in the dataset (3.2%); (d) did not provide a legitimate UK postcode, completed the survey outside the UK, or provided inconsistent or questionable responses (24.7%). The final sample consisted of 2,185 responses (*n*=1,037 veterans and *n*=1,148 non-veterans). Veterans and non-veterans were a minimum of 18 years old and not currently serving in the UK AF. The non-veteran sample was limited to those who were domiciled within the UK; however, veterans who provided a valid service number but had emigrated since leaving the AF were included (1% of the veteran sample). All participants were reimbursed with a £20 shopping voucher on completion of the study.

The study protocol was reviewed by Wales NHS Research Ethics Committee 6 and obtained favourable HRA and Health and Care Research Wales (HCRW) approval (REC reference 19/WA/0134) and was conducted in accordance with STROBE guidelines. All procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

## Measures

The UK AF Veterans’ Health and Gambling Study is an age- and gender-matched cross-sectional online survey of UK veterans no longer serving in the military and those who have never served in the military (non-veterans). As well as sociodemographic characteristics, primary outcome variables included gambling severity and motivation, mental health (anxiety, depression, PTSD, and C-PSTD, and alcohol and nicotine use.

**Sociodemographic variables**. Respondents were asked their sex (as defined at birth), gender (i.e., male, female, non-binary, prefer to self-define/not to say, other), age, ethnicity (i.e., White-British/Irish, Any other white background, Mixed – White and Black Caribbean/Black African/Asian, Any other mixed background, Asian or Asian British – Indian/Pakistani/Bangladeshi, Any other Asian/Asian British background, Black or Black British – Caribbean/African, Any other Black/Black British background, Chinese, Prefer not to say, Any other), relationship status (i.e., single, in a relationship, co-habiting, never married, married-first and only marriage/second or later marriage, separated, divorced, widowed, other), highest qualification (e.g., no formal qualifications, General Certificate of Secondary Education (GCSE), Advanced Subsidiary (AS)/Advanced (A) Levels, bachelor’s degree), accommodation type (e.g., owner-occupier, privately rented flat or house, sheltered housing, rehabilitation/long-stay psychiatric ward, homeless), and who they lived with (i.e., alone, children under 18/over 18, spouse/partner, other family, parent(s), non-family, other).

**Military demographic variables**. Veterans provided their service number and further details about their military service including years served, branch (e.g., Royal Navy, Royal Marines, Army, Royal Air Force, Merchant Navy) and trade in service, type of discharge (e.g., medical, at own request, end of engagement), rank at discharge, number of deployments, deployment length, and deployment locations. Locations were selected from a list of thirty-seven deployments (see Supplementary Materials) including Northern Ireland, Falkland Islands, Gulf War (1990-1991), Afghanistan (2001-2014), Iraq (2003-2011), Iran-Iraq conflict (1977), and non-combat and low combat United Nations/NATO peacekeeping missions (e.g., Somalia, Bosnia). Respondents could select more than one deployment location and indicate other locations using a self-completion textbox.

**Gambling participation and activities**.Respondents were asked whether they had participated in one or more of 19 gambling activities within the past year (Wardle et al., 2007; see Supplementary Materials). If participants had gambled, they proceeded to the gambling severity and motivation measures. If not, they proceeded directly to the mental health measures.

**Gambling severity and motivation variables.** The *Problem Gambling Severity Index* (PGSI; Ferris & Wynne, 2001) comprises nine items measuring problematic gambling. Respondents use a 4-point scale to rate how often in the past year they had experienced a particular behaviour (e.g., ‘*Have you bet more than you could really afford to lose*?’), from ‘*Never*’ (0) to ‘*Almost Always’* (3). Scores are summed, with 0 indicative of *non-problem gambling*, scores of 1-2 classified as *low-risk gambling,* scores between 3 and 7 are indicative of *moderate-risk gambling*, and scores of 8 or above indicate *problem gambling*.

The *Gambling Functional Assessment - Revised* (GFA-R; Weatherly et al., 2014) is a 16-item measure of gambling motivations. Respondents use a 7-point scale to rate how often, from ‘*Never*’ (0) to ‘*Always*’ (6) a particular experience motivates their gambling (e.g., ‘*I gamble when I feel stressed or anxious*.’). The scores are summed and two subscales, or ‘motivations,’ for gambling derived: positive reinforcement and negative reinforcement.

**Mental health variables.** The *Patient Health Questionnaire* (PHQ-9; Kroenke et al., 2001) was used to screen for depression. Comprised of nine items, respondents use a 4-point scale to categorise how often over the last 2 weeks they have experienced a certain statement related to symptoms of depression (e.g., ‘*Little interest or pleasure in doing things*’) ranging from 0 (‘*not at* all’) to 3 (‘*nearly every day*’). The scores are summed and threshold scores of 0-4 indicate none or mild depression, 5 is considered minimal depression, ³10 is considered moderate, ³15 is considered moderately severe, and ³ 20 indicates severe depression, respectively.

The *Generalised Anxiety Disorder assessment* (GAD-7; Spitzer et al., 2006) is a 7-item inventory for the screening of generalised anxiety disorder. Respondents use the same scale as the PHQ-9 to score how often over the last 2 weeks they feel they have experienced a certain statement related to symptoms of generalised anxiety disorder (e.g., “*Not being able to stop or control worrying*.*”*). The scores are summed, with scores of 0-4 indicating none/normal levels of anxiety, 5-9 is considered mild, 10-14 is considered moderate, and 15-21 is considered severe anxiety.

The *International Trauma Questionnaire* (ITQ; Cloitre et al., 2018) is an eighteen-item measure for the diagnosis of post-traumatic stress disorder (PTSD) and complex PTSD (C-PTSD) based on ICD-11. The ITQ is comprised of four sections, with the first two sections determining probable PTSD, and the second two sections, identifying Disturbances in Self-Organization (DSO). In the first section, respondents report how much they experienced any of six problems within the past month (e.g., “*Feeling jumpy or easily startled*”). Pairs of questions in this section relate to three PTSD symptom clusters: re-experiencing in the here and now, avoidance, and sense of current threat. The second section asks whether the above problem has affected any of three domains of life (e.g., “*Affected your work or ability to work*?). The questions in this section relate to functional impairment from PTSD. The third section asks how a respondent ‘typically’ feels, thinks about themselves, or how they might relate to others in six statements (e.g., “*I feel like a failure*”). Pairs of questions in this section relate to symptoms from three DSO clusters: affective dysregulation, negative self-concept, and disturbances in relationships. The final section asks how the emotions identified in the third section may have affected three domains of the respondent’s life (e.g., “*Created concern or distress about your relationships or social life*”). The questions in this section relate to functional impairment from DSO. Respondents use a 5-point Likert-scale to indicate their responses to questions in all sections, from 0 (‘*Not at all*’) to 4 (‘*Extremely*’). For a diagnosis of PTSD, respondents must score above the threshold (greater than, or equal to 2) for each PTSD symptom cluster, and above this threshold on the PTSD functional impairment section. For a diagnosis of C-PTSD, respondents must score above the threshold (greater than, or equal to 2) for each DSO symptom cluster, and above this threshold on the DSO functional impairment section in addition to meeting the diagnosis criteria for PTSD. Respondents can receive either a potential diagnosis of PTSD or C-PTSD, not both.

**Alcohol use and nicotine dependence.** The *Alcohol Use Disorders Identification Test* (AUDIT; Babor et al., 2001) is a 10-item screening tool for harmful alcohol consumption. Respondents use 5-point scales to rate their drinking behaviour in three-axes: how often (e.g., ‘*How often do you have a drink containing alcohol*?’: ‘Never’ to ‘4+ times per week.’), how much (e.g., ‘*How many units of alcohol do you drink on a typical day when you are drinking*?’: ‘0-2’ to ‘10+’), and their personal perceptions of their own drinking behaviour (e.g., ‘*How often during the last year have you had a feeling of guilt or remorse after drinking*?’: ‘Never’ to ‘Daily or almost daily’). The final two questions ask whether someone has ever been injured as a direct result of the respondent’s drinking and whether someone has been concerned about the respondent’s drinking habits. Respondents use a 3-point Likert scale ranging from ‘No’ to ‘Yes, but not in the last year’, and ‘Yes, during the last year’.

The *Fagerström Test for Nicotine Dependence* (FTND; Heatherton et al., 1991) is a six-item measure of the quantity of cigarette consumption, the compulsion to use, and dependence. Four of these questions are binary ‘yes’ or ‘no’ questions (e.g., “*Do you smoke more frequently during the first hours after waking than during the rest of the day*?”), with one multiple choice question (e.g., “*How many cigarettes per day do you smoke?”)* rated from 1 (*10 or less)* to 4 (*31 or more*) and another (e.g., *“How soon after waking do you smoke your first cigarette*?”) rated from 1 (*within 5 minutes*) to 3 (*31-60 minutes*). The items are summed for total score of 0-10, with higher scores indicating greater nicotine dependency.

## Data analysis

Associations between veteran status and outcome variables were calculated using chi-square tests of association, unadjusted odds ratios were calculated for significant associations, and differences between groups analysed using parametric analysis (i.e., t-tests and one-way ANOVA).

Stepwise multiple linear regressions were utilised to predict gambling severity as measured by continuous PGSI score. Four models were developed either based on factors known to influence the development of problem gambling (Dixon et al., 2018; Etuk et al., 2020; Moore & Grubbs, 202; Sharman et al., 2019; Weatherly et al., 2011, 2014) or about which little information is currently known among veterans. The first model utilised sociodemographic characteristics, the second military demographics, the third mental health variables, and the fourth gambling activities and motivation variables. Continuously scored variables were entered as ordinal variables to compensate for non-transformable non-normality. These ordinal variables models were included as binary dummy variables of each category (Rosenberg et al., 2013). Multicollinearity of variables was examined by inspection of variance inflation factors (VIF); these all remained below 2 indicating that variables were not closely correlated for regression analysis.

Skewness and kurtosis of the PGSI data was within accepted threshold tolerances for normal univariate distribution (+/- 2; George & Mallery, 2010; Hair et al., 2010; Kline, 2011). For the full sample, skewness was identified as 1.297 (SE =.058) with a kurtosis of 0.642 (SE=.117); for the veteran subsample, continuous PGSI score skewness was calculated as 0.574 (SE = .079) with a kurtosis of -0.840 (SE = 0.159).

\*\*\*Insert Table 1 About Here\*\*\*

# Results

## Sociodemographics

As shown in Table 1, the sociodemographic characteristics of the veteran cohort are consistent with the profile of the UK AF veteran population (Ministry of Defence, 2019). Most veterans were male (93.5%), with a mean age of 46.69 (*SD*=13.21), white-British, married, resided in England, and in paid employment. Veterans tended to be educated to GCSE level A\*-C or above and living with family. Most of both samples were not in receipt of benefits, yet the proportion of veterans who were (45.8%) was more than twice that of non-veterans (23.5%). Overall, the samples were adequately matched for age and gender, but did inadvertently differ by country of residence, ethnicity, marital status, employment, qualifications, household arrangement, accommodation, and benefits.

\*\*\*Insert Table 2 About Here\*\*\*

## Military demographics

Table 2 shows military demographic characteristics of the veterans’ sample. Most veterans had served in the Army, for between 5-9 years, had two or more operational deployments (see Supplementary Materials), and left at the end of their engagement period, 12 or more years ago.

\*\*\*Insert Table 3 About Here\*\*\*

## Gambling

Table 3 displays gambling activities, severity, and motivations for both samples. Veterans were over 4 times more likely to have gambled in the past year (*p* <.001) and did so on more activities (*p* <.001) than non-veterans. Of the sample, 43.1% of veterans and 6.5% of non-veterans experienced problem gambling. Veterans were over 10 times more likely to be distinguished by problem gambling than non-veterans (*p* <.001). Veterans’ gambling was over 7 times more likely to be motivated by negative reinforcement (*p* <.001) compared to non-veterans.

\*\*\*Insert Table 4 About Here\*\*\*

## Mental health

Table 4 displays the prevalence of mental health variables. The single largest proportion of both veterans and non-veterans reported no symptoms of depression (30.4% and 55%, respectively) or anxiety (38.7% and 64.9%, respectively) and most did not reach the threshold for diagnosis of PTSD. However, veterans were more than 4 times more likely to have a diagnosis of likely PTSD and almost 7 times more likely than non-veterans to have a diagnosis of C-PTSD. Most non-veterans experienced lower risk drinking while most veterans experienced increasingly hazardous drinking levels. Veterans and non-veterans were generally non-smokers.

\*\*\*Insert Table 5 About Here\*\*\*

## Predictors of gambling severity

Analysis, using four stepwise multiple regression models, was conducted using clustered factor blocks of sociodemographics, military demographics, mental health, and gambling activities and motivations.

Nine significant predictors of veterans’ PGSI scores (*F* (9,937) = 42.26, *p* <.001) from the sociodemographic variables were included in the first model (Table 5). The multiple correlation for these nine predictors was *R*= .54, accounting for 28.9% of PGSI score variance. Age was the strongest predictor, accounting for 21.0% of the variance (Δ*R2* = .210, F (1,945) = 251.02, p <.001). Additionally, being of White-British ethnicity (ΔR2 = .009), achieving a Doctorate as one’s highest qualification Δ*R2* = .004) and, living with non-family members (Δ*R2* = .003) were negative predictors of continuous PGSI score (i.e., protective factors). Conversely, positive predictors of continuous PGSI score (i.e., risk factors) included the respondent being in receipt of benefits (Δ*R2* = .041), living in supported accommodation (Δ*R2* = .008), being married (Δ*R2* = .006) and living in privately rented accommodation (Δ*R2* = .003).

In the second model, eleven significant predictors (*F* (11,902) = 44.27, *p* <.001) were included (Table 5). In combination, these predictors had a multiple correlation of *R*= .59, which accounted for 35.1% of the variance within PGSI scores. Serving for longer than 20 years was the strongest predictor of PGSI score, accounting for 12.5% of variance (Δ*R2* = .125, *F* (1,912) = 129.92, *p* <.001). Additionally, serving for between 10-19 years (Δ*R2* = .044), being discharged 25+ years ago (Δ*R2* = .034), discharge due to a reason listed as ‘other’ (Δ*R2* = .009), not being deployed during their career (Δ*R2* = .008), being discharged at their own request (ΔR2 = .003), and being medically discharged (ΔR2 = .004) were negative predictors of PGSI score (i.e., protective factors). Positive predictors of PGSI score (i.e., risk factors) were being discharged 9-13 years ago (Δ*R2* = .103), serving for between 0-4 years (Δ*R2* = .009), and serving in the Royal Navy (Δ*R2* = .005).

The third model evaluated the role of mental health variables to predict veterans’ PGSI scores. Entered stepwise, seven significant predictors (*F* (7,770) = 59.08, *p* <.001) were included (Table 5) that accounted for 35.9% of the variability in PGSI scores with a multiple correlation of *R*= .59. The strongest predictor was having no symptoms of depression within the last 2 weeks and accounted for 19.9% of the variance in PGSI score (ΔR2 = .199, *F* (1,776) = 193.28, *p* <.001). Additionally, no likely PTSD diagnosis (ΔR2 = .080), severe anxiety (ΔR2 = .015) and lower risk drinking (ΔR2 = .008) comprised the negative predictors (i.e., protective factors) of PGSI score in this model. The positive predictors were possible alcohol dependence (ΔR2 = .026), higher risk drinking (ΔR2 = .018), and mild anxiety (ΔR2 = .004).

The final model analysed the role of gambling activities and motivations in predicting veterans’ PGSI scores. Three significant, positive predictors (*F* (3,943) = 364.79, *p* <.001) were included (Table 5), accounting for 53.7% of variance within PGSI scores with a multiple correlation of *R*= .73. The strongest predictor was gambling due to negative reinforcement, accounting for 40.8% of PGSI score variance (ΔR2 = .408, *F* (1,945) = 651.48, *p* <.001), followed by number of gambling activities (ΔR2 = .127) and gambling due to positive reinforcement (ΔR2 = .002), respectively.

# Discussion

This study represents the first survey of gambling risk factors among a large sample of community-dwelling UK AF veterans. Consistent with findings from both the UK (Dighton et al., 2018; Roberts et al., 2019) and internationally (Etuk et al., 2020; Levy & Tracy, 2018), we found that UK veterans were at increased risk of problem gambling. Veterans gambled on more activities than their non-veterans, and their gambling was motivated by negative reinforcement (escape from or avoidance of distress). In line with previous findings, veterans experienced numerous symptoms of depression, anxiety, risky alcohol use, nicotine dependence at higher levels, and increased indications of PTSD and C-PTSD diagnoses compared to non-veterans (Biddle et al., 2005; Goodwin et al., 2015; Murphy et al., 2021). Our regression analysis identified that veteran status was a significant predictor of increased PGSI score along with gambling due to negative reinforcement. Length of service and years since discharge also predicted a decrease in gambling severity. These findings indicate that longer service in the AF may be a protective factor; however, negative mental health outcomes may exacerbate gambling problems soon after leaving the AF, with gambling being further motivated by a need to escape or avoid distress.

Our most striking finding was that 43.1% of the veterans’ sample experienced problem gambling and were 10 times more likely to do so than non-veterans. The estimated rate and odds ratio are significantly higher than other studies of problem gambling severity in veterans conducted using the PGSI. For instance, a previous study of *n*=1324 members of the Australian Defence Force deployed between 2010 and 2012 found that 2% experienced problem gambling (PGSI>5) and that 7.7% reported at least some gambling related problems post-deployment (Cowlishaw et al., 2020). Notably, greater difficulties were most pronounced in early service leavers serving in the Army as non-commissioned officers (NCOs)/Other Ranks. Our findings partially mirror these, with length of service a key predictor of harm among most of our veterans who had served in the UK Army in NCO roles, albeit with substantially higher distinguishing rates of problem gambling. Comparing our findings on problem gambling to the extant literature, Biddle et al. (2005) noted rates of 28% and Grant et al. (2017) rates of 25.9% among help-seeking samples of veterans receiving treatment for alcohol dependence and co-occurring psychiatric disorders, respectively. The present findings indicate high, previously undetected estimated rates of problem gambling in UK veterans (Dighton et al., 2018; Roberts et al., 2019).

It was notable that 8.6% veterans in the current study met criteria for likely PTSD, with 26.6% indicating probable C-PTSD. These findings are lower than the rates reported in help-seeking UK samples (*n=*96, 54.3%) (Murphy et al., 2021). Evidence suggests that C-PTSD is more common in veterans than PTSD (Murphy et al., 2019, 2021; Stevelink et al., 2018) and, although research focussing on comorbidites is limited, the association between C-PTSD and poor treatment outcomes for veterans is relatively well understood (Kitchiner et al., 2019; Murphy et al., 2019; Phelps et al., 2018). Complex emotional responses, such as guilt and shame, are closely related to the disorder of self-organisation component of C-PTSD (Goodwin et al., 2015) that also overlaps with problem gambling, with shame motivating coping by negative reinforcement in gambling (Schlagintweit et al., 2017). Our findings do however indicate, for the first time, the co-occurrence of problem gambling and C-PTSD in veterans.

The motivation to gamble due to negative reinforcement was the strongest predictor of increased PGSI score in the veteran sample. Indeed, veterans who gambled were over 7 times more likely to be motivated to do so due to avoidance or escape from distress. This unique finding parallels the elevated levels of alcohol misuse that is considered a potential negative coping strategy in veterans (Goodwin et al., 2015). In interviews on coping with trauma in the military, Williamson et al. (2019) noted that some veterans indicated that ‘avoidance’ was the most accessible coping strategy; avoidance is core to the symptomatology of PTSD. Taken together, these findings highlight increased scores on mental health variables and high rates of probable C-PTSD in the veterans’ sample, suggesting that gambling may become a maladaptive, avoidant coping mechanism for veterans.

Identifying the motivations or functions of gambling has novel implications for clinical treatment of gambling problems. Although the present study adopted a broadly two-factor approach as revealed by the GFA-R and found that problem gambling among veterans was significantly motivated by the moderation or amelioration of heightened stress (i.e., negative reinforcement), it is unlikely that there are just two distinct functions of gambling related problems (i.e., positive or negative reinforcement) and that a four-factor model may have greater clinical utility. As Dixon et al. (2018) describe, these four-factors of “social attention (e.g., enjoyment of interacting with peers), psychological/physical escape (e.g., ability to forget about stress at home, leave a troubled work environment), access to tangible rewards (e.g., money, comps, vouchers), and sensory (e.g., feeling a rush or buzz)” (p.177) account for topographies of reinforcement-maintained gambling behaviour, yet a complete assessment also necessitates identification of relevant antecedent conditions (i.e., those life events that precede or prompt occurrence of the different functions at different times). Such a functional analytic approach is consistent with the goals of case conceptualisation where individuals are interviewed about the triggers to their gambling or the antecedents that may prompt relapse if they are in recovery. Determining both the antecedents and motivations (i.e., consequences) of gambling may aid in the development of individualised treatment plans and assist with cross-validation of self-report-based assessment interviews with functional assessment outcomes measured by the recently developed four-factor GFA-II (Dixon et al., 2018). The potential utility of this functional approach warrants further investigation with vulnerable populations like veterans. Doing so may lead to greater synthesis with established treatments from behavioural psychology for negatively reinforced behaviour (Miltenberger, 2015), perhaps as adjunct treatments for gambling problems identified through prior functional assessment (Hofmann & Hayes, 2019; Hurl et al., 2016).

Our findings indicate that screening for potential gambling problems should be conducted by the UK AF as it is with military personnel in the USA (Etuk et al., 2020; Levy & Tracy, 2018; Milton et al., 2019). At present, gambling is not assessed in pre-enlistment screening processes or during active service and discharge procedures. Doing so in pre-existing surveys such as the AF Continuous Attitudes Survey would establish parity of care for gambling-related harm with, for instance, substance use disorders among personnel who are at heightened vulnerability for problem gambling.

## Limitations

The present study was conducted almost entirely online (78.3% of veterans and 100% of non-veterans were recruited in this way), with recruitment primarily carried out through targeted paid content on social media for a survey of ‘veterans’ health and gambling’. While potential study sampling effects and the risk of self-selection bias cannot therefore be ruled out (Angus et al., 2021), we employed recommended methods for increasing data quality such as participant screening, removing duplicate and non-sensical responses, presenting content-knowledge questions (e.g. providing a service number that was correctly structured and within date bounds), and IP address geolocation and monitoring (Pickering & Blaszczynski, 2021). Collecting data online may have inadvertently excluded older veterans, those without access to the internet, and the homeless. The range and complexity of the measures obtained online may have benefitted from the inclusion of attention-checks and controls to reduce response set and/or prompt truthful answers from respondents. The samples differed on 8 of the 10 demographic characteristics examined that are known to be associated with increased risk of gambling problems (Allami et al., 2021). Moreover, some data were collected during COVID-19 national lockdowns. Additional stress related to the pandemic may have facilitated problematic, risky behaviours (Albertella et al., 2021) and influenced reporting. Further cross-cultural comparative research should examine the impact of the different gambling legislative environments on reported estimates of gambling problems in veterans. Finally, the study used self-report measures rather than clinical interviews for mental health conditions which may limit generalizability.

## Conclusions

The present study provides the first gambling-focussed source of data in UK AF veterans with an age- and gender-matched comparison group of non-veterans. We found that problem gambling is significantly higher in UK veterans, is a likely coping mechanism for mental health conditions, and driven by a need to avoid or escape distress. In veterans, problem gambling cooccurred with, for the first time, C-PTSD. Screening for problem gambling should be undertaken to provide improved treatment and support.

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# Tables

Table 1

*Sociodemographic characteristics of the veterans’ and non-veterans’ sample*s

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Veterans**  **(*n* = 1,037)** | | **Non-veterans**  ***(n* = 1,148)** | | ***p*** | |
| ***n*** | **%** | ***n*** | **%** |
| **Gender** |  |  |  |  |  |  |
| Male | 970 | 93.5 | 1054 | 91.8 | .123 | .278 |
| Female | 64 | 6.2 | 91 | 7.9 | .111 |
| Other | 3 | 0.3 | 3 | 0.3 | .901 |
| **Age** |  |  |  |  |  |  |
| 18-29 | 63 | 6.1 | 73 | 6.4 | .788 | 1.00 |
| 30-39 | 346 | 33.4 | 383 | 33.4 | .986 |
| 40-49 | 201 | 19.4 | 221 | 19.3 | .929 |
| 50-59 | 222 | 21.4 | 246 | 21.4 | 1.00 |
| 60-69 | 155 | 15.0 | 171 | 14.9 | .966 |
| 70-79 | 40 | 3.9 | 45 | 3.9 | .943 |
| 80+ | 9 | 0.9 | 9 | 0.8 | .827 |
| **Country** |  |  |  |  |  |  |
| England | 805 | 77.6 | 965 | 84.1 | <.001‡ | <.001‡ |
| Wales | 127 | 12.2 | 76 | 6.6 | <.001‡ |
| Scotland | 67 | 6.5 | 84 | 7.3 | .431 |
| Northern Ireland | 28 | 2.7 | 23 | 2.0 | .282 |
| Other | 10 | 1.0 | 0 | 0.0 | .001‡ |
| **Ethnicity** |  |  |  |  |  |  |
| White British | 960 | 92.6 | 1020 | 88.9 | .003‡ | |
| Other | 77 | 7.4 | 128 | 11.1 |
| **Marital Status** |  |  |  |  |  |  |
| Single | 103 | 9.9 | 243 | 21.2 | <.001‡ | <.001‡ |
| In a relationship | 95 | 9.2 | 160 | 13.9 | .001‡ |
| Co-habiting | 47 | 4.5 | 138 | 12.0 | <.001‡ |
| Married | 510 | 49.2 | 440 | 38.3 | <.001‡ |
| Married 2nd+ | 166 | 16.0 | 87 | 7.6 | <.001‡ |
| Separated | 25 | 2.4 | 22 | 1.9 | .426 |
| Divorced | 70 | 6.8 | 45 | 3.9 | .003‡ |
| Widowed | 21 | 2.0 | 13 | 1.1 | .092 |
| **Employment** |  |  |  |  |  |  |
| Unemployed, not actively seeking | 14 | 1.4 | 24 | 2.1 | .186 | .010**†** |
| Unemployed, actively seeking | 55 | 5.5 | 63 | 5.3 | .849 |
| In training/education | 24 | 2.3 | 15 | 1.3 | .076 |
| In sheltered work | 9 | 0.9 | 0 | 0.0 | .002‡ |
| In paid employment | 704 | 67.9 | 810 | 70.6 | .177 |
| Not working due to long term illness | 64 | 6.2 | 51 | 4.4 | .071 |
| Looking after home/family | 20 | 1.9 | 21 | 1.8 | .864 |
| Retired | 147 | 14.2 | 164 | 14.3 | .941 |
| **Highest Qualification a** |  |  |  |  |  |  |
| No formal qualification | 63 | 6.1 | 24 | 2.1 | <.001‡ | <.001‡ |
| Entry certificate | 34 | 3.3 | 16 | 1.4 | .003‡ |
| GCSE D-G | 153 | 14.8 | 83 | 7.2 | <.001‡ |
| GCSE A\*-C | 311 | 30.0 | 156 | 13.6 | <.001‡ |
| AS/A level | 153 | 14.8 | 199 | 17.3 | .101 |
| Certificate of HE | 125 | 12.1 | 87 | 7.6 | <.001‡ |
| Bachelor's degree | 116 | 11.2 | 355 | 30.9 | <.001‡ |
| Master's degree | 78 | 7.5 | 189 | 16.5 | <.001‡ |
| Doctorate | 4 | 0.4 | 39 | 3.4 | <.001‡ |
| **Household Arrangement** |  |  |  |  |  |  |
| Live alone | 180 | 17.4 | 201 | 17.5 | .926 | .008‡ |
| Live with family | 844 | 81.4 | 910 | 79.3 | .214 |
| Live with non-family | 13 | 1.3 | 37 | 3.2 | .002‡ |
| **Accommodation** |  |  |  |  |  |  |
| Domestic/family | 130 | 12.5 | 146 | 12.7 | .898 | <.001‡ |
| Owner | 493 | 47.5 | 637 | 55.1 | <.001‡ |
| Privately rented | 211 | 20.3 | 250 | 21.8 | .413 |
| Rented from local authority | 163 | 15.7 | 106 | 9.2 | <.001‡ |
| Community/supported living | 37 | 3.6 | 6 | 0.5 | <.001‡ |
| Homeless | 3 | 0.3 | 0 | 0.0 | .068 |
| Other | 0 | 0.0 | 3 | 0.3 | .099 |
| **Benefits** |  |  |  |  |  |  |
| Yes | 475 | 45.8 | 269 | 23.5 | <.001‡ | |
| No | 562 | 54.2 | 877 | 76.5 |

a Qualification categories describe qualifications based on the English educational qualification system of equivalent level of attainment and may not be the qualification the respondent holds. *p* = Significance of Pearson’s χ2 test. **†** Indicates significance where *p* < 0.05. ‡ Indicates significance where *p* < 0.01

Table 2

*Military demographic characteristics of the veterans’ sample*

**

Table 3

*Gambling activities, severity, and motivation for veterans and non-veterans who had participated in gambling activities within the past year.Notes: p* = Significance of Pearson’s χ2 test, except for total activities where the significance of a t-test is presented. **†** Indicates significance where *p* < 0.05. ‡ Indicates significance where *p* < 0.01

*Table 4.* Comparison of mental health outcome variables between veterans and non-veterans.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Veterans** | | **Non-veterans** | | ***p*** | | **OR (95% CI)** |
| **n** | **%** | **n** | **%** |
| **Depression** | *1002* |  | *1145* |  |  |  |  |
| No Depression | 305 | 30.4 | 630 | 55.0 | <.001‡ | <.001‡ | 0.36 (0.30 - 0.43) |
| Mild | 269 | 26.8 | 274 | 23.9 | .121 | 1.17 (0.96 - 1.42) |
| Moderate | 271 | 27.0 | 116 | 10.1 | <.001‡ | 3.30 (2.59 - 4.17) |
| Moderately Severe | 72 | 7.2 | 87 | 7.6 | .716 | 0.94 (0.68 - 1.30) |
| Severe | 85 | 8.5 | 38 | 3.3 | <.001‡ | 2.70 (1.82 - 4.00) |
| **Anxiety** | *1002* |  | *1145* |  |  |  |  |
| No Anxiety | 388 | 38.7 | 743 | 64.9 | <.001‡ | <.001‡ | 0.34 (0.29 - 0.41) |
| Mild | 354 | 35.3 | 224 | 19.6 | <.001‡ | 2.25 (1.85 - 2.73) |
| Moderate | 167 | 16.7 | 106 | 9.3 | <.001‡ | 1.96 (1.51 - 2.54) |
| Severe | 93 | 9.3 | 72 | 6.3 | .009‡ | 1.53 (1.11 - 2.10) |
| **Posttraumatic Stress Disorder** | *852* |  | *1148* |  |  |  |  |
| No Diagnosis | 552 | 64.8 | 1064 | 92.7 | <.001‡ | <.001‡ | 0.15 (0.11 - 0.19) |
| Likely PTSD | 73 | 8.6 | 26 | 2.3 | <.001‡ | 4.04 (2.56 - 6.39) |
| Likely C-PTSD | 227 | 26.6 | 58 | 5.1 | <.001‡ | 6.83 (5.03 - 9.26) |
| **Alcohol Use** | *967* |  | *1138* |  |  |  |  |
| Non-drinker | 112 | 11.6 | 170 | 14.9 | .024 | <.001‡ | 0.75 (0.58 - 0.96) |
| Lower Risk | 239 | 24.7 | 598 | 52.5 | <.001‡ | 0.30 (0.25 - 0.36) |
| Increasing Risk | 332 | 34.3 | 271 | 23.8 | <.001‡ | 1.67 (1.38 - 2.02) |
| Higher Risk | 144 | 14.9 | 38 | 3.3 | <.001‡ | 5.07 (3.50 - 7.32) |
| Possible Alcohol Dependence | 140 | 14.5 | 61 | 5.4 | <.001‡ | 2.99 (2.18 - 4.09) |
| **Nicotine Dependence** | *965* |  | *1137* |  |  |  |  |
| Non-Smoker | 587 | 60.8 | 976 | 85.8 | <.001‡ | <.001‡ | 0.26 (0.21 - 0.32) |
| Very Low | 1 | 0.1 | 1 | 0.1 | .908 | 1.18 (0.07 - 18.86) |
| Low | 39 | 4.0 | 57 | 5.0 | .287 | 0.80 (0.53 - 1.21) |
| Medium | 143 | 14.8 | 40 | 3.5 | <.001‡ | 4.77 (3.32 - 6.85) |
| High | 162 | 16.8 | 58 | 5.1 | <.001‡ | 3.75 (2.74 - 5.13) |
| Very High | 34 | 3.5 | 6 | 0.5 | <.001‡ | 6.88 (2.88 - 16.47) |

*Notes:* Sample respondent totals reported for each measure. *p* = Significance of Pearson’s χ2 test. OR: unadjusted Odds Ratio. 95% CI: Upper and lower bound 95% confidence intervals. † Indicates significance where p < 0.05. ‡ Indicates significance where p < 0.01.

**Table 5: Stepwise multiple linear regression models for clustered theoretical predictors of veterans’ continuous PGSI scores.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Sociodemographics** | | | | **Military Demographics** | | | | **Mental Health** | | | | **Gambling** | | | |
| **Model Summary** |  | | | |  | | | |  | | | |  | | | |
| *R* | .54 | | | | .59 | | | | .59 | | | | .73 | | | |
| *R2* | .29 | | | | .35 | | | | .35 | | | | .54 | | | |
| Adjusted *R2* | .28 | | | | .34 | | | | .34 | | | | .54 | | | |
| *p* | <.001 | | | | <.001 | | | | <.001 | | | | <.001 | | | |
| **Significant Predictors** | B | *β* | *t* | *p* | B | *β* | *t* | *p* | B | *β* | *t* | *p* | B | *β* | *t* | *p* |
| *(Constant)* | *15.72* |  | *16.42* | *<.001* | *7.86* |  | *18.81* | *<.001* | *8.69* |  | *17.29* | *<.001* | *.046* |  | *0.15* | *<.001* |
| Age | -0.20 | -.40 | -13.83 | <.001 |  |  |  |  |  |  |  |  |  |  |  |  |
| Ethnicity | -2.55 | -.11 | -3.77 | <.001 |  |  |  |  |  |  |  |  |  |  |  |  |
| Benefits | 2.41 | .19 | 6.71 | <.001 |  |  |  |  |  |  |  |  |  |  |  |  |
| Relationship Status (Married) | 1.11 | .09 | 3.02 | .003 |  |  |  |  |  |  |  |  |  |  |  |  |
| Highest Qualification (Doctorate) | -6.35 | -.07 | -2.33 | .020 |  |  |  |  |  |  |  |  |  |  |  |  |
| Accommodation (Private Rent) | 0.97 | .06 | 2.14 | .033 |  |  |  |  |  |  |  |  |  |  |  |  |
| Accommodation (Supported Living) | 4.23 | .12 | 4.27 | <.001 |  |  |  |  |  |  |  |  |  |  |  |  |
| Live with Non-Family | -3.92 | -.06 | -2.24 | .025 |  |  |  |  |  |  |  |  |  |  |  |  |
| Length of Service (20+ Years) |  |  |  |  | -6.70 | -.40 | -12.84 | <.001 |  |  |  |  |  |  |  |  |
| Length of Service (10-19 Years) |  |  |  |  | -2.75 | -.16 | -5.44 | <.001 |  |  |  |  |  |  |  |  |
| Length of Service (0-4 Years) |  |  |  |  | 1.86 | .13 | 4.09 | <.001 |  |  |  |  |  |  |  |  |
| Years Since Discharge (25+ Years) |  |  |  |  | -2.80 | -.19 | -6.35 | <.001 |  |  |  |  |  |  |  |  |
| Years Since Discharge (9-13 Years) |  |  |  |  | 2.76 | .20 | 6.69 | <.001 |  |  |  |  |  |  |  |  |
| Branch (Royal Navy) |  |  |  |  | 1.04 | .07 | 2.46 | .014 |  |  |  |  |  |  |  |  |
| Not Deployed |  |  |  |  | -1.57 | -.09 | -3.14 | .002 |  |  |  |  |  |  |  |  |
| Discharge (Other) |  |  |  |  | -4.17 | -.11 | -3.82 | <.001 |  |  |  |  |  |  |  |  |
| Discharge (At Own Request) |  |  |  |  | -1.07 | -.08 | -2.65 | .008 |  |  |  |  |  |  |  |  |
| Discharge (Medical) |  |  |  |  | -1.46 | -.07 | -2.41 | .016 |  |  |  |  |  |  |  |  |
| PHQ-9 (No Depression) |  |  |  |  |  |  |  |  | -3.18 | -.23 | -6.18 | <.001 |  |  |  |  |
| GAD-7 (Mild Anxiety) |  |  |  |  |  |  |  |  | 1.02 | .08 | 2.22 | .026 |  |  |  |  |
| GAD-7 (Severe Anxiety) |  |  |  |  |  |  |  |  | -2.07 | -.09 | -2.83 | .005 |  |  |  |  |
| AUDIT (Lower Risk Drinking) |  |  |  |  |  |  |  |  | -1.35 | -.09 | -2.83 | .005 |  |  |  |  |
| AUDIT (Higher Risk Drinking) |  |  |  |  |  |  |  |  | 2.08 | .11 | 3.56 | <.001 |  |  |  |  |
| AUDIT (Possible Alcohol Dependence) |  |  |  |  |  |  |  |  | 3.10 | .18 | 5.56 | <.001 |  |  |  |  |
| ITQ PTSD (No PTSD) |  |  |  |  |  |  |  |  | -3.85 | -.29 | -8.55 | <.001 |  |  |  |  |
| Number of Gambling Activities |  |  |  |  |  |  |  |  |  |  |  |  | 0.72 | .35 | 14.97 | <.001 |
| GFA-R (Negative Reinforcement) |  |  |  |  |  |  |  |  |  |  |  |  | 7.86 | .59 | 20.00 | <.001 |
| GFA-R (Positive Reinforcement) |  |  |  |  |  |  |  |  |  |  |  |  | 0.83 | .06 | 2.25 | .025 |

# Supplemental Material

**Location of deployments for the veteran sample (*n*=1,037)**

|  |  |  |
| --- | --- | --- |
| **Deployment Location** | ***n*** | **%** |
| Northern Ireland | 352 | 33.9 |
| Falklands Islands | 176 | 17 |
| Gulf War (1991) | 88 | 8.4 |
| Afghanistan (2001 to 2014) | 163 | 15.7 |
| Iraq (2003-2011) | 151 | 14.5 |
| Bosnia | 134 | 12.9 |
| Cyprus | 99 | 9.5 |
| Kosovo | 70 | 6.7 |
| Kenya | 75 | 7.2 |
| Rwanda | 8 | 0.8 |
| Belize | 69 | 6.7 |
| Sierra Leone | 19 | 1.8 |
| Lebanon | 8 | 0.8 |
| World War II | 0 | 0.0 |
| Cuban Crisis | 1 | 0.1 |
| Macedonia | 13 | 1.3 |
| Pakistan | 8 | 0.8 |
| Iraq/Iran conflict (1977) | 13 | 1.3 |
| Hong Kong | 46 | 4.4 |
| Singapore | 36 | 3.5 |
| Darfur | 10 | 1.0 |
| Aden | 24 | 2.3 |
| Columbia | 21 | 2.0 |
| Chile | 15 | 1.4 |
| Somalia | 23 | 2.2 |
| South Africa | 19 | 1.8 |
| Rhodesia | 8 | 0.8 |
| Egypt | 9 | 0.9 |
| Libya | 16 | 1.5 |
| Russia | 2 | 0.2 |
| Grenada | 6 | 0.6 |
| Ivory Coast | 7 | 0.7 |
| Guyana | 1 | 0.1 |
| Oman | 37 | 3.6 |
| Yemen | 11 | 1.1 |
| Vietnam | 5 | 0.5 |
| East Timor | 4 | 0.4 |
| Other (self-derived) | 99 | 9.5 |
| None | 164 | 15.8 |

**Gambling Activities**

Have you spent any money on any of the following activities in the last **12 months?** (Please tick **one**box for each activity)

|  |  |  |
| --- | --- | --- |
|  | YES | NO |
| Tickets for the National Lottery Draw (including Thunderball and Euromillions and tickets bought online) |  |  |
| Scratchcards (but not online or newspaper or magazine scratchcards) |  |  |
| Tickets for any other lottery (including charity lotteries) |  |  |
| Football pools |  |  |
| Bingo cards or tickets (including playing at a bingo hall but not online) |  |  |
| Fruit or slot machines |  |  |
| Virtual gambling machines in a bookmakers (to bet on virtual roulette, poker, blackjack or other games) |  |  |
| Table games in a casino (roulette, cards or dice) |  |  |
| Poker in pub tournament/league or at a club |  |  |
| Online gambling for money (poker, bingo, instant win/scratchcard games, slot machine style games or casino games) |  |  |
| Online betting with a bookmaker on any event or sport |  |  |
| Betting Exchange (this is where you lay or back bets against other people using a betting exchange. There is no bookmaker to determine the odds. This is sometimes called 'peer to peer' betting) |  |  |
| Betting on horse races (in a bookmakers, by phone or at the track) |  |  |
| Betting on dog races (in a bookmakers, by phone or at the track) |  |  |
| Betting on sports events (in a bookmakers, by phone or at the venue) |  |  |
| Betting on other events/races (in a bookmakers, by phone or at the venue) |  |  |
| Spread Betting (in spread betting, you bet that the outcome of an event will be higher or lower than the bookmakers' prediction. The amount you win or lose depends on how right or wrong you are.) |  |  |
| Private betting (playing cards or games for money with friends, family or colleagues) |  |  |
| |  | | --- | | Another form of gambling in the last 12 months. Please specify: | |  |  |

