

## Gambling problems and the impact of family in UK armed forces veterans

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**Background and aims:** International evidence indicates elevated problem gambling rates in armed forces veterans compared with the general population. Gambling problems adversely impact one's family, and family-related variables may increase vulnerability to gambling-related harm. Little is known, however, about gambling problems in the United Kingdom (UK) veterans or to what extent family variables, such as parenting history and experience of domestic violence, influence veterans' gambling. **Methods:** We compared veterans ( $n = 257$ ) and sex- and age-matched controls ( $n = 514$ ) drawn from the 2007 *Adult Psychiatric Morbidity Survey* on gambling, financial management, domestic violence, childhood parental presence, and experience of stressful life events. Veterans who left the military before or after 4 years of service were compared. **Results:** Problem gambling was significantly more prevalent in veterans (1.4%) than non-veterans (0.2%), and the impact of gambling problems on the family was specific to male veterans, particularly those who had experienced a traumatic event after the age of 16, and those who were more likely to have been physically attacked by their partner. Overall, this study revealed that the UK armed forces veterans report a higher prevalence rate of problem gambling compared with non-veterans, with potential negative impact on family life.

**Keywords:** gambling, veterans, family, domestic violence, prevalence

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### INTRODUCTION

The transition from active armed forces service to civilian life (or returning to “Civvy Street”) is often difficult. During transition, armed forces veterans are more likely to engage in high-risk behaviors, such as smoking, drug and alcohol use, unsafe sexual practices, dangerous driving, and excessive gambling (Steenbergh, Whelan, Meyers, Klesges, & DeBon, 2008; Thandi et al., 2015). Risky behaviors like problem gambling may also be accompanied or exacerbated by mental health problems (e.g., depression and anxiety), with conflicting international evidence about whether or not veterans are more vulnerable to these problems than non-veterans (Kennedy, Cook, Poole, Brunson, & Jones, 2005; Samele, 2013; Woodhead et al., 2011). In the general population, problem gambling is often highly comorbid with anxiety and depression (Petry, Stinson, & Grant, 2005), and also predicts the onset of generalized anxiety disorder and posttraumatic stress disorder (PTSD; Kessler et al., 2008). Marriage has long been regarded as a protective factor for veterans suffering from PTSD (Weisenhorn, Frey, van de Venne, & Cerel, 2017), and the role of close family as a key support network for problem gamblers is well established (Kalischuk, Nowatzki, Cardwell, Klein, & Solowoniuk, 2006). Ultimately, however, the family also sustains a number of gambling-related harms, such as increases in financial difficulty (Li, Browne, Rawat, Langham, & Rockloff, 2017) and intimate

partner violence (Roberts et al., 2016) often caused by a consequence of dealing with a hidden gambling problem. Therefore, it is conceivable that coping with such problems is likely to be exaggerated in veterans during transition. Given the complex interrelated nature of mental health and gambling problems, and the unique challenges faced by veterans back on Civvy Street, this study sought to examine the relationship between gambling problems, mental health, and family support in veterans and non-veterans.

Prevalence rates of problem gambling are higher in armed forces veterans than the general population. Westermeyer, Canive, Thuras, Oakes, and Spring (2013) determined that the prevalence rate of “pathological gambling” in the United States veterans was 2%, whereas Whiting et al. (2016) recently identified a combined prevalence rate of 4.2% for *at-risk* and *probable* categories of pathological gambling. Similar, albeit higher, findings are seen in Australian treatment-seeking samples (Biddle, Hawthorne, Forbes, & Coman, 2005). On the contrary, no comparative survey of gambling problems currently exists for the UK armed forces community. Recently, however, we undertook a preliminary examination of this issue using the 2007 *Adult Psychiatric Morbidity Survey* (APMS), a population-representative

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study of English community-dwelling adults (>16 years) measuring the prevalence rates of both treated and untreated psychiatric disorders (Roberts et al., 2017). The 2007 APMS was utilized, because it includes data on both military service and gambling behavior. Matched samples of age- and sex-matched veterans and non-veterans were extracted and compared. We found that veterans were eight times more likely to be classified as problem gamblers compared with non-veterans. The relationship between veteran status and problem gambling was not explained by mental health, substance abuse, or financial management, and no differences were detected between length of military service and gambling. This indicates that the UK veterans are at greater risk of gambling-related problems than non-veterans and that prior mental health factors do not necessarily predispose veterans from developing gambling problems (Roberts et al., 2017). However, previous work on the APMS and focusing on the general, non-veteran population identified associations between problem gambling and healthcare usage, mental and physical health indicators, and psychosocial adjustment (Cowlshaw & Kessler, 2015). Indeed, overrepresentation of problem gambling within specific healthcare settings, particularly in mental health and negative psychosocial domains (e.g., financial difficulty and suicidality), was observed. Given that financial difficulties are found to affect one in five veterans with dependent children (Ashworth, Hudson, & Malam, 2014) and the obvious financial and employment challenges faced during transition, further research is required to examine the nature and extent of the relationship with problem gambling in veterans and the impact it may have on families.

The family is central to theoretical models of the pathways leading to problem gambling (Blaszczynski & Nower, 2002). One pathway states that family members are at a high-risk of becoming behaviorally conditioned to engage in gambling due to their own family members' gambling. A second pathway proposes that negative family experiences across the life course may produce a gambler who is emotionally vulnerable and one who relies on gambling to meet psychosocial needs and modulate their mood. However, these pathways have yet to be extended to account for the impact of gambling-related harm on the family and familial influence on gambling motivation in veterans' families.

Increased opportunities to gamble means that both veterans and non-veterans may use gambling to socialize with others (Thomas, Lewis, Westberg, & Derevensky, 2013). The desire to socialize is a likely corollary of many veterans' perception of isolation from society on their return to civilian life (Stack, 2013), particularly as returning from active military service may increase the sense of separation between the veteran and their family (Ahern et al., 2015; Riggs & Riggs, 2011). This separation is likely worsened by problem gambling, with clear evidence showing the impact of gambling-related harm on several domains including the family (Kalischuk et al., 2006). Gambling-related harm occurs across seven broad domains, such as financial harm, relationship disruption/conflict/breakdown, emotional/psychological distress, decrements to health, cultural harm, reduced performance at work or study, and criminal activity

(Langham et al., 2016). Each of these domains impacts on the family of a problem gambler or in parallel to familial factors (Langham et al., 2016). Problem gamblers also transfer around half of these harms to affected others (Li et al., 2017) with the spouse, children, and parents of the problem gambler considered to be on the frontline of harms borne by affected others (Kalischuk et al., 2006). This range of harms mirrors how families may be affected by deployment, such as disruptions in family routine, compromised parenting, and adverse psychological health (Lester & Flake, 2013; Paley, Lester, & Mogil, 2013).

The current exploratory study examined the potential impact on the family of gambling-related harm in the UK armed forces veterans. In line with previous international findings (e.g., Roberts et al., 2017; Whiting et al., 2016), we expected problem gambling levels to be higher in veterans than non-veterans. We also examined how family variables like childhood parental presence and incidence of domestic violence may influence gambling. Given the theoretical importance a positive familial experience plays in limiting the predisposition to gambling problems (Blaszczynski & Nower, 2002), it was expected that veterans who have experienced domestic violence may be more likely to exhibit problem gambling.

## METHODS

### *Sample data set*

The 2014 edition of the APMS did not include items on gambling (McManus, Bebbington, Jenkins, & Brugha, 2016); secondary data analysis was therefore undertaken with the 2007 APMS. Sampling was conducted according to a multistage, stratified probability design based on geographical region and socioeconomic status. The response rate for the first stage of the study was approximately 57% with 7,461 adults responding, and with 4.7% of those identified as armed forces veterans (85.2% male).

### *Sample used for secondary analyses*

Following prior literature (Roberts et al., 2017; Woodhead et al., 2011), proxy interviews, veterans who served during the period of compulsory conscription (prior to 1960), non-veterans of comparable age ( $\geq 65$  years), current members of the armed forces, and veterans responding with ages improbable for joining or leaving the armed forces (i.e., joining when under 16 years old or over 55 years old) were excluded from the final data set. This resulted in a final sample of 257 veterans. Veterans were further distinguished by length of service. The minimum engagement period of 4 years (British Army, 2015) was used to classify veterans as either early service leavers or non-early service leavers. Previous literature has demonstrated variance in gambling behavior by sex and age (Cowlshaw & Kessler, 2015), and thus a sex- and age-matched control sample of 514 non-veterans was also generated.

## Measures

Sociodemographic measures obtained from the APMS included sex (male and female), age in 10-year groups (16–24, 25–34, 35–44, 45–54, 55–64), race (white and non-white), marital status (single, married or cohabiting, widowed or divorced or separated), and household size [(one adult aged 16–59 with no children; two adults both aged 16–59 with no children); small family (i.e., one or two adults aged 16–59 with one or two children); large family (i.e., one adult aged 16–59 with three or more children or three or more adults aged 16–59 with two children); large adult household (i.e., three or more adults aged 16–59 with one or no children; two adults, one or both aged 60+ with no children; and one adult aged 60+ with no children)]. Unless otherwise cited, the measures taken from the APMS were all devised for use in the original fieldwork (McManus, Meltzer, Brugha, Bebbington, & Jenkins, 2009).

Gambling problems were assessed using the 10 items from the *DSM-IV* problem gambling diagnostic criteria (American Psychiatric Association [APA], 1994). Respondents were classified based on DSM-IV as “no risk” (0 criteria), “at risk” (1–2 criteria), “problem gambler” (3–4 criteria), or “pathological gambler” (5 or more criteria).

Financial management was assessed by three separate questions on borrowing, debt, and financial crises. Binary variables were generated from these questions with borrowing from at least one source (e.g., a pawnbroker, family member, and friend), being behind in paying at least one bill (e.g., rent, utilities, and credit cards), and having a major financial crisis in the past 6 months being used for analyses.

Stressful life events were measured as having experienced a major trauma since the age of 16, having ever exhibited self-harm behavior, and having ever attempted suicide. Major traumatic events were identified on one variable, derived from whether the respondent had experienced a life-threatening event or something that had put the respondent at serious risk (i.e., seeing someone being killed, being raped, or experiencing a natural disaster) since the age of 16.

Self-harm was assessed using three items from the *Revised Clinical Interview Schedule* (CIS-R; Lewis, Pelosi, Araya, & Dunn, 1992): “Have you ever thought of taking your life, even if you would not really do it?;” “Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?;” “Have you deliberately harmed yourself in any way but not with the intention of killing yourself?” A binary variable was generated with a positive response to one or more of the items compared with no self-harm behaviors experienced for analysis. Suicide attempts were specifically measured by the CIS-R item: “Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?”

Domestic violence was measured by asking respondents whether they had ever received death threats from their partner, whether they ever had money withheld from them by their partner, and whether they had ever been physically attacked by their partner. A binary variable was generated to

analyze the occurrence of physical attacks by partners by measuring whether a positive response was given to one or more of the subsequent questions: “Has a current or previous partner ever pushed you, held or pinned you down or slapped you?;” “Has a current or previous partner ever kicked you, bit you, or hit you with a fist or something else, or threw something at you that hurt you?;” “Has a current or previous partner ever choked or tried to strangle you?;” “Has a current or previous partner ever used a weapon against you, e.g., a knife?”

Respondents were screened for whether they experienced worries, obsessions, or irritability attributed to their spouse/partner or family. These concerns were assessed using CIS-R items measuring separately for spouse/partner and family collapsed into three separate, binary variables examining worries, obsessions, and irritability.

The independence of the respondent from their family was determined using two variables from the APMS-devised *activities of daily living* (ADLs) scale: whether they needed help with one or more ADLs (e.g., “Difficulties with managing money”) and whether they were helped to complete ADLs by one or more family members.

Further family-related variables considered for the analysis were the number of children (none to 4+) and the respondent’s childhood parental presence before the age of 16 (whether they lived with both parents, lived with a single parent, split their time equally between both single parents, lived with another relative, or spent time in an institution).

## Statistical analysis

Statistical analysis was conducted using STATA, version 14.0 (StataCorp, 2015) allowing for correction of the complex survey design with the APMS’s weighting, clustering, and stratification criteria (McManus et al., 2009).

Pearson’s  $\chi^2$  tests, with second-order Rao and Scott’s (1987) corrections for survey design, and cross tabulation were used to test associations between veteran status and demographics, family-related variables, domestic violence, and stressful life events. Logistic regression analyses determined the relationship between gambling behavior, financial management, veteran status, early leaver status, family-related variables, traumatic experiences, and domestic violence, with odds ratios (ORs) and confidence intervals (CIs) at 95% reported alongside significance levels (*p*). Linear regressions modeled predictions of increased endorsement of DSM-IV problem gambling criteria using variables that were significantly associated with veteran status, or leaver status, as the predictors. Presented percentages were weighted to account for the complex survey design; frequencies were not weighted.

## Ethics

This study comprises a secondary analysis of a Public Health data set made available for research. Ethics for the original fieldwork for the APMS 2007 was obtained from the Royal Free Hospital and Medical School Research Ethics Committee (06/Q0501/71).

RESULTS

Demographics

For veterans, the median age for males was 49 [interquartile range (IQR 40–59)] and for females was 46 (IQR 39–58). For the non-veteran sample, the median age for males was 49 (IQR 39–58) and for females was 48 (IQR 36–58). Statistically, male veterans were significantly more likely to be either married or cohabiting with a partner than their non-veteran counterparts ( $p = .049$ ), whereas female veterans were significantly more likely to be either widowed, divorced, or separated than female non-veterans ( $p = .027$ ). Male veterans were significantly more likely to be currently dwelling in a household with a small family (one or two adults and one or two children;  $p = .022$ ), whereas male non-veterans were more likely to be dwelling in a household with one adult (aged 16–59) with no children ( $p = .037$ ) (Table 1).

Gambling problems

We independently replicated our earlier findings (Roberts et al., 2017) showing that veterans had a significantly higher

“problem gambler” prevalence rate than non-veterans (Table 2). That is, 1.4% of sampled veterans were identified as problem gamblers, compared with 0.2% of non-veterans ( $p = .036$ ). No statistically significant differences were found in gambling problems between early service leavers and veterans with more than 4 years service.

When categories of gambling severity were collapsed to “no risk” and “at risk problem gamblers” (ARPG; Whiting et al., 2016), respectively, of the 30 (3.9%) respondents that made up the ARPG category, 9 were veterans (3.6%) and 21 were non-veterans (4.0%). Of the 689 classified as “no risk,” 233 were veterans (96.4%) and 456 were non-veterans (96.0%). The difference between proportions of ARPGs and no risk in these groups was not statistically significant ( $p = .822$ ).

Financial management

We found no statistically significant differences between veterans and non-veterans in financial management criteria. While borrowing money was associated more with those leaving the services early compared with those staying in the services for more than 4 years, this trend was not significant ( $p = .073$ ) (Table 3).

Table 1. Comparison of sociodemographic characteristics between male and female veterans and non-veterans

	Males				<i>p</i>	Females				<i>p</i>		
	Non-veterans ( <i>n</i> = 420)		Veterans ( <i>n</i> = 210)			Non-veterans ( <i>n</i> = 94)		Veterans ( <i>n</i> = 47)				
	<i>n</i>	%	<i>n</i>	%		<i>n</i>	%	<i>n</i>	%			
Age group (years)												
16–24	10	3.70	5	4.36	.773	.959	8	11.99	4	17.20	.540	.894
25–34	42	12.22	21	13.80	.642		12	13.87	6	11.82	.747	
35–44	118	29.58	59	27.21	.539		20	21.73	10	18.36	.642	
45–54	96	24.63	48	24.28	.929		24	24.52	12	28.19	.647	
55–64	154	29.87	77	30.35	.902		30	27.89	15	24.42	.662	
Ethnicity												
White	387	89.6	200	94.5	.076	.087	87	91.4	44	85.8	.525	.479
Non-white	32	10.5	10	5.5	.088		6	8.6	3	14.2	.474	
Marital status												
Single	80	17.16	24	10.65	.070	.105	19	22.31	7	17.36	.588	.221
Married/cohabiting	272	72.28	150	79.59	.049*		62	70.42	26	65.38	.599	
Widowed/divorced/ separated	68	10.56	36	9.76	.728		13	7.27	14	17.25	.027*	
Household size												
One adult aged 16–59, no children	86	12.14	30	7.74	.037*	.083	14	8.45	12	19.60	.055	.119
Two adults, both aged 16–59, no children	102	26.75	52	27.13	.916		24	26.63	13	30.02	.699	
Small family	60	15.34	48	23.46	.022*		18	17.33	7	14.31	.660	
Large family	22	6.78	12	8.42	.554		2	1.71	3	7.23	.092	
Large adult household	66	24.41	23	17.54	.107		19	31.88	5	18.69	.206	
Two adults, one or both aged 60+, no children	62	12.30	31	12.39	.972		14	12.60	3	5.97	.216	
One adult, aged 60+, no children	22	2.28	14	3.32	.266		3	1.39	4	4.18	.131	

Note. Percentages are weighted to account for complex survey design; case numbers are unweighted and may not therefore sum due to missing values. *p*: the significance of Pearson’s  $\chi^2$  test with second-order Rao and Scott’s correction for survey design.

\*Significant result where  $p < .05$ .

Table 2. Comparison of gambling-related outcomes between non-veterans and veterans and between armed forces service early leaver veterans and veterans with more than 4 years experience

	<i>n</i>	%	<i>n</i>	%	<i>p</i>	OR [95% CI]
	Non-veterans ( <i>n</i> = 514)		Veterans ( <i>n</i> = 257)			
DSM-IV gambling score						
0 (no risk)	456	96.01	233	96.39	.822	.112 1.11 [0.45–2.75]
1–2 (at-risk)	18	3.54	6	2.21	.375	0.61 [0.21–1.82]
3–4 (problem gambler)	1	0.17	3	1.41	.036*	8.17 [0.79–84.05]
5+ (pathological gambler)	2	0.03	0	0	.337	n/a
	>4 years service ( <i>n</i> = 142)		<4 years service ( <i>n</i> = 114)			
DSM-IV gambling score						
0	129	96.21	103	96.56	.899	.954 1.10 [0.23–5.19]
1–2 (at-risk)	5	2.49	1	1.88	.790	0.75 [0.09–6.38]
3–4 (problem gambler)	1	1.29	2	1.56	.880	1.21 [0.10–14.83]
5+ (pathological gambler)	0	0	0	0	–	n/a

Note. Percentages are weighted to account for complex survey design; case numbers are unweighted and may not therefore sum due to missing values. *p*: the significance of Pearson’s  $\chi^2$  test with second-order Rao and Scott’s correction for survey design; OR: odds ratio; 95% CI: confidence interval at 95%.

\*Significant result where *p* < .05.

Table 3. Comparison of gambling-related outcomes and financial difficulties between armed forces service early leaver veterans and veterans with more than 4 years experience

	<i>n</i>	%	<i>n</i>	%	<i>p</i>	OR [95% CI]
	Non-veterans ( <i>n</i> = 514)		Veterans ( <i>n</i> = 257)			
Financial management						
Financial difficulties (past year)	52	10.22	26	9.97	.917	0.97 [0.58–1.64]
Had to borrow money (past year)	43	7.82	17	6.10	.353	0.77 [0.43–1.35]
Major financial crisis (past 6 months)	11	1.83	4	1.58	.812	0.86 [0.24–3.04]
Spent money on gambling (past year)	363	71.77	193	74.98	.371	1.18 [0.82–1.69]
	<4 years service ( <i>n</i> = 114)		>4 years service ( <i>n</i> = 142)			
Financial management						
Financial difficulties (past year)	17	12.46	8	7.06	.204	1.87 [0.70–5.02]
Had to borrow money (past year)	14	10.12	3	2.76	.073	3.97 [0.79–19.9]
Major financial crisis (past 6 months)	3	2.00	1	1.23	.672	1.64 [0.16–17.0]
Spent money on gambling (past year)	86	74.07	107	76.44	.718	0.88 [0.44–1.76]

Note. Percentages are weighted to account for complex survey design; case numbers are unweighted and may not therefore sum due to missing values. *p*: the significance of Pearson’s  $\chi^2$  test with second-order Rao and Scott’s correction for survey design; OR: odds ratio; 95% CI: confidence interval at 95%.

\*Significant result where *p* < .05.

Family-related variables

Male non-veterans were significantly more likely to be childless compared with male veterans (*p* = .046) and were more likely have lived with both parents until the age of 16 (*p* = .011), whereas male veterans were more likely to have lived with a relative other than their parents (*p* = .009). Early service leavers were significantly less likely to have had any children than non-early service leavers (*p* = .044); however, when adjusted for age, this difference did not reach statistical significance (*p* = .913). Non-early service leavers were significantly more likely to have lived with a relative other than their parents until the age of 16 (*p* = .028).

Stressful life events

Experience of major traumatic events since the age of 16 was significantly more likely in male veterans than in male

non-veterans (*p* = .005). This also follows for veterans with longer service experience: those who served for more than 4 years were significantly more likely to have experienced a major traumatic event since the age of 16 than those leaving the armed forces before completing 4 years of service (*p* = .039). Of those who had experienced traumatic events, 28 male veterans (28.6%; *p* = .047) and 27 non-early service leavers (38.9%; *p* = .001) stated that the events were related to military experience.

Domestic violence

Statistically, male veterans were significantly more likely than non-veterans to have been physically attacked by their partner (*p* = .013). This difference was not found to be statistically significant between female veterans and non-veterans, or for early service leavers and non-early service leavers.

### Family concerns

Differences were observed concerning obsessions about family, spouse, or partner between female veterans and non-veterans, with female veterans being six times more likely to experience these obsessions than non-veterans (OR = 6.07). However, these trends did not reach statistical significance ( $p = .087$ ).

### ADLs

There were no statistically significant differences found concerning the ADL items, veteran status, or early service leaver status (Tables 4 and 5).

### Factors predicting gambling behavior

Male veterans who had experienced a major traumatic event (since the age of 16) were more likely to be classed as “at-risk” of developing problem gambling than being classed as “at no-risk” ( $p = .045$ ). This was the only outcome variable, and gender subpopulation, that was significantly associated with both veteran status and gambling. Although not significantly different ( $p = .225$ ), male veterans who had been physically attacked by their partner were over three times as likely to be classed as a problem gambler than at no-risk (OR = 3.64). However, linear prediction models of DSM-IV problem gambling criteria endorsement and potential factors predicting gambling behavior did not approach statistical significance (Table 6).

## DISCUSSION

Consistent with existing international evidence, our results show that problem gambling rates are higher in the UK veterans than in non-veterans (Roberts et al., 2017). Further analysis revealed that male veterans were significantly more likely than male non-veterans to have ever experienced a major traumatic event since the age of 16. In addition, male veterans were more likely to have lived with a relative other than their parent until the age of 16 and to have been physically abused by their partner, compared with their male non-veteran counterparts. These findings indicate that veterans are at a greater risk of developing problem gambling habits than non-veterans. Moreover, this vulnerability may be influenced by experience of traumatic events, as well as familial relationships, although our analyses failed to find definitive evidence for this.

The UK veterans have a greater prevalence of problem gambling compared with non-veterans corroborates international findings from Australia (Biddle et al., 2005) and the USA (Westermeyer et al., 2013; Whiting et al., 2016). Here, the proportional incidence of problem gambling in veterans (1.4%) was significantly higher than in age- and sex-matched non-veterans (0.2%) ( $p < .05$ ). Problem gambling in veterans was however double that of the UK general population prevalence rate (Gambling Commission, 2018). This increased rate in veterans compared with the general population is also in line with previous findings from the USA (Westermeyer et al., 2013). Given the differing

conventions used when reporting gambling severity, such as comparing ARPG with problem gamblers alone (Stefanovics, Potenza, & Pietrzak, 2017), the proportion we identified of ARPG within the UK armed forces veterans (3.6%) is consistent with evidence from USA veterans. For example, a 4.2% prevalence rate was reported by Whiting et al. (2016), whereas Stefanovics et al. (2017) noted a 2.2% prevalence rate in their respective ARPG samples. Our findings are therefore consistent with and contribute to international research on the severity of gambling-related problems in veterans.

Sociodemographics like family structure, parental separation, and family socioeconomic status are related to increased risk taking during adolescence and across the life span (McComb & Sabiston, 2010; Otten, Engels, van de Ven, & Bricker, 2007). Although we found that veterans were more likely to live with a relative other than their parents, compared with non-veterans, there was no significant trend with problem gambling severity. Langhinrichsen-Rohling, Rohde, Seeley, and Rohling (2004) noted that, rather than the composition of the family relating to gambling severity, the importance of a positive family environment should instead be emphasized. Intrafamily conflict, lack of support, and emotional distance are highly prevalent among problem gamblers, even affecting those classified as “at-risk” (Saugeres, Thomas, & Moore, 2014). These factors are also highly prevalent in veterans returning from active military service (Paley et al., 2013; Riggs & Riggs, 2011) and it is thus likely that a negative family environment contributes to the development of veterans’ problem gambling. This assertion would fit with theoretical perspectives of pathways to problem gambling (Blaszczynski & Nower, 2002), with a negative family environment potentially leading to an emotionally vulnerable veteran relying on gambling to modulate their mood.

Domestic violence within military families is well-researched, with physical violence in particular, thought to account for up to 90% of all substantive cases of intimate partner violence (Rentz et al., 2006). The current finding that male veterans were significantly more likely than male non-veterans to have been physically abused by their partner (OR = 1.83) is relatively novel; research into physical violence has tended to overlook actively serving males or male veterans as victims (Ritchie, 2016, pp. 123–127). A meta-analysis found that 31% of male active service members were victims of intimate partner violence (Gierisch et al., 2013); however, there are no such comparable data for male veterans. Yet, in a recent sample representative of the UK general population, male problem gamblers were 4.5 times more likely than non-problem gamblers to have experienced domestic violence at the hands of their partner (Roberts et al., 2016). Comparatively then, the findings of this study – that male veterans are 1.83 times more likely than non-veterans to have experienced physical abuse from their partner – suggest that armed forces service may be a preclusive to experiencing domestic violence as a victim.

### Limitations

There was a relatively small number of both veterans and gamblers in the total sample. However, associations

Table 4. Comparison of family-related variables and personal outcomes between male and female veterans and non-veterans

	Males						Females						
	Non-veterans (n = 420)			Veterans (n = 210)			Non-veterans (n = 94)			Veterans (n = 47)			
	n	%	p	n	%	OR [95% CI]	n	%	p	n	%	OR [95% CI]	
Children													
None	126	29.22	.046*	43	20.68	.222	0.63 [0.40–0.99]	17	20.71	.272	11	30.67	1.71 [0.65–4.46]
1	68	16.13	.129	43	21.61		1.44 [0.90–2.30]	16	15.75	.451	6	11.00	0.67 [0.23–1.94]
2	134	31.34	.331	78	35.72		1.22 [0.82–1.83]	32	31.67	.526	18	37.24	1.29 [0.58–2.85]
3	54	14.21	.768	27	13.25		0.92 [0.55–1.56]	17	19.89	.380	9	13.77	0.65 [0.24–1.72]
4+	37	9.11	.895	19	8.73		0.96 [0.50–1.84]	11	11.98	.433	3	7.32	0.58 [0.15–2.29]
Childhood parental presence													
Lived with both parents	350	83.57	.011*	156	75.64	.027*	0.59 [0.39–0.89]	81	85.45	.856	40	83.61	0.90 [0.29–2.79]
Lived with single parent	52	13.24	.436	31	15.87		1.22 [0.74–2.00]	9	11.14	.741	5	13.41	1.24 [0.34–4.54]
Split time between both parents	7	1.52	.122	7	3.41		2.25 [0.78–6.48]	1	0.90	.916	1	1.04	1.16 [0.07–19.60]
Lived with other relative	3	0.42	.009*	6	2.39		5.73 [1.30–25.17]	1	1.60	.496	0	0	n/a
Spent time in care or institute	6	1.25	.216	6	2.70		2.16 [0.62–7.60]	1	0.90	.573	1	1.93	2.18 [0.14–34.98]
Stressful life events													
Major traumatic event experienced (since 16)	160	36.67	.005*	102	49.49		1.69 [1.17–2.44]	29	32.63	.395	19	41.26	1.45 [0.61–3.44]
Any self-harm behaviors <sup>a</sup>	60	11.74	.189	38	15.63		1.39 [0.85–2.29]	24	23.60	.262	17	33.40	1.62 [0.69–3.80]
Attempted suicide	16	2.93	.182	12	4.85		1.69 [0.78–3.68]	9	7.89	.139	9	15.71	2.17 [0.76–6.22]
Domestic violence													
Physically attacked by partner <sup>b</sup>	58	13.07	.013*	45	21.57		1.83 [1.13–2.95]	28	28.29	.797	14	26.05	0.89 [0.38 – 2.12]
Death threats from partner	11	2.06	.407	7	3.19		1.56 [0.54–4.56]	8	7.25	.277	7	13.03	1.92 [0.58–6.31]
Money withheld by partner	24	5.01	.185	17	7.86		1.62 [0.79–3.31]	14	15.81	.684	10	18.65	1.22 [0.46–3.22]
Family concerns (CIS-R)													
Worries due to family/spouse/partner	88	20.05	.852	40	19.38		0.96 [0.61–1.50]	42	43.27	.088	13	27.50	0.50 [0.22–1.12]
Irritability due to family/spouse/partner	36	9.63	.928	17	9.37		0.97 [0.50–1.88]	19	19.82	.220	6	11.33	0.52 [0.18–1.51]
Obsessions about family/spouse/partner	7	1.24	.485	5	1.90		1.55 [0.45–5.33]	1	0.54	.087	3	3.21	6.07 [0.58–63.60]
Activities of daily living													
Help needed for 1+ ADL	125	25.57	.196	66	30.44		1.27 [0.88–1.84]	36	35.83	.630	17	31.45	0.82 [0.37–1.83]
Helped by 1+ family member	49	9.95	.258	25	13.05		1.36 [0.80–2.32]	15	14.74	.966	8	15.01	1.02 [0.38–2.72]

Note. Percentages are weighted to account for complex survey design; case numbers are unweighted and may not therefore sum due to missing values. *p*: the significance of Pearson's  $\chi^2$  test with second-order Rao and Scott's correction for survey design; OR: odds ratio; 95% CI: confidence interval at 95%.

<sup>a</sup>Participant gave a positive response to one or more of the subsequent questions: "Have you ever thought of taking your life, even if you would not really do it?"; "Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?"; "Have you deliberately harmed yourself in any way but not with the intention of killing yourself?"

<sup>b</sup>Participant gave a positive response to one or more of the subsequent questions: "Has a current or previous partner ever pushed you, held or pinned you down or slapped you?"; "Has a current or previous partner ever kicked you, bit you, or hit you with a fist or something else, or threw something at you that hurt you?"; "Has a current or previous partner ever choked or tried to strangle you?"; "Has a current or previous partner ever used a weapon against you, i.e., a knife?"

\*Significant result where  $p < .05$ .

Table 5. Comparison of family-related variables and personal outcomes between armed forces service early leaver veterans and veterans leaving with more than 4 years experience

	>4 years service (n = 142)		<4 years service (n = 114)		p	OR [95% CI]
	n	%	n	%		
Children						
None	26	17.29	28	28.19	.044*	1.88 [1.01–3.49]
1	25	17.31	24	23.50	.270	1.47 [0.74–2.90]
2	60	42.15	36	28.97	.058	0.56 [0.31–1.02]
3	18	13.91	18	12.78	.783	0.91 [0.45–1.83]
4+	13	9.34	8	6.56	.435	0.68 [0.26–1.81]
Childhood parental presence						
Lived with both parents	104	72.24	91	79.72	.261	1.51 [0.73–3.12]
Lived with single parent	18	13.81	18	17.19	.570	1.30 [0.53–3.20]
Split time between both parents	6	4.54	2	1.22	.105	0.26 [0.05–1.49]
Lived with other relative	6	3.70	0	0	.028*	n/a
Spent time in care or institute	6	4.19	1	0.63	.044	0.15 [0.02–1.27]
Stressful life events						
Major traumatic event experienced (since 16)	74	54.70	46	40.24	.039*	0.56 [0.32–0.97]
Any self-harm behaviors <sup>a</sup>	25	16.36	30	20.71	.388	1.34 [0.69–2.59]
Attempted suicide	9	5.88	12	7.21	.652	1.24 [0.48–3.23]
Domestic violence						
Physically attacked by partner <sup>b</sup>	31	23.26	28	21.25	.730	0.89 [0.46–1.73]
Death threats from partner	9	5.94	5	3.16	.223	0.52 [0.17–1.53]
Money withheld by partner	16	10.69	11	8.10	.481	0.74 [0.31–1.74]
Family concerns (CIS-R)						
Worries due to family/spouse/partner	24	18.38	29	23.41	.374	1.36 [0.69–2.68]
Irritability due to family/spouse/partner	15	10.36	8	8.93	.754	0.85 [0.31–2.32]
Obsessions family/spouse/partner	2	1.11	6	3.28	.196	3.02 [0.52–17.69]
Activities of daily living (ADLs)						
Help needed for 1+ ADL	45	31.83	37	28.38	.588	0.85 [0.47–1.54]
Helped by 1+ family member	15	12.44	18	14.56	.628	1.20 [0.57–2.52]

Note. Percentages are weighted to account for complex survey design; case numbers are unweighted and may not therefore sum due to missing values. *p*: the significance of Pearson's  $\chi^2$  test with second-order Rao and Scott's correction for survey design; OR: odds ratio; 95% CI: confidence interval at 95%.

<sup>a</sup>Participant gave a positive response to one or more of the subsequent questions: "Have you ever thought of taking your life, even if you would not really do it?"; "Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?"; "Have you deliberately harmed yourself in any way but not with the intention of killing yourself?"

<sup>b</sup>Participant gave a positive response to one or more of the subsequent questions: "Has a current or previous partner ever pushed you, held or pinned you down or slapped you?"; "Has a current or previous partner ever kicked you, bit you, or hit you with a fist or something else, or threw something at you that hurt you?"; "Has a current or previous partner ever choked or tried to strangle you?"; "Has a current or previous partner ever used a weapon against you, e.g., a knife?"

\*Significant result where  $p < .05$ .

between financial management variables and a larger sample of gamblers and non-gamblers are observed in the 2007 APMS (Wardle, Griffiths, Orford, Moody, & Volberg, 2012). The limited number of veterans who gamble in the APMS may be related to barriers in the disclosure of health-related issues (Sharp et al., 2015) or even in accurately self-identifying as a veteran (Burdett et al., 2013). Although the APMS is considered to be representative and therefore an estimate of morbidity within the English population at the time (McManus et al., 2009), the small sample size restricts comparable, well-powered exploration, and analysis of the relationships arising between family life, gambling, and veterans.

Since the fieldwork and the release of the results from this APMS data set obtained a decade ago, the diagnostic criteria regarding problem gambling have changed with the

release of the DSM-5 (APA, 2013). "Gambling disorder" is now measured by 9 criteria rather than 10. Furthermore, the threshold for diagnosis of gambling disorder was also lowered: individuals must now meet 4 out of 9 criteria, instead of 5 out of 10. This lowered threshold level had previously been argued to increase the accuracy of diagnosis, lowering the level of false-negative diagnoses (Stinchfield, 2003). Questions have therefore arisen about how the reclassification of problematic gambling will influence both diagnosis and public perception of gambling, and in turn, how this will affect prevalence surveys (Petty, Blanco, Stinchfield, & Volberg, 2013; Reilly & Smith, 2013). Moreover, the absence of gambling-related questions in the 2014 APMS (McManus et al., 2016) and the lack of identification of armed forces veterans in other large sample community surveys (Health Survey for England 2015:



Table 6. Outcome variables, significantly associated with veteran status, modeled as predicting problematic gambling severity

	No risk (0)				At risk (1)				Problem gambler (2)				Pathological gambler (3)				Regression models		
	n		%		n		%		n		%		n		%		(0) vs. (1) OR [95%CI]	(0) vs. (2) OR [95%CI]	(0) vs. (3) OR [95%CI]
	n	%	n	%	n	%	n	%	n	%	n	%	n	%					
Male (n = 630)	451	80.66	16	67.59	4	100	1	100	0.50	[0.17–1.46]	n/a	n/a	n/a						
Lived with both parents	8	1.09	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a						
Lived with other relative	238	41.35	7	20.62	1	33.67	0	0	0.37	[0.14–0.98]*	0.74	[0.06–9.21]	n/a						
Major traumatic event experienced (since 16)	86	14.92	5	24.44	2	39.74	1	100	1.81	[0.56–5.68]	3.64	[0.45–29.54]	n/a						
Physically attacked by partner	189	33.02	6	24.70	3	79.75	0	0	0.66	[0.22–1.98]	8.10	[0.79–83.37]	n/a						
Veteran																			
Female (n = 141)																			
No significant outcome variables for female participants																			
>4 years service (n = 142)	5	3.64	0	0	0	0	0	0	n/a	n/a	n/a	n/a	a						
Lived with other relative	71	57.30	1	15.44	0	0	0	0	0.14	[0.15–1.30]	n/a	n/a	n/a						
Major traumatic event experienced (since 16)	25	27.72	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a						
<4 years service (n = 114)																			
No children																			

Note. Percentages are weighted to account for complex survey design; case numbers are unweighted and may not therefore sum due to missing values. OR: odds ratio; 95% CI: confidence interval at 95%.  
 aNo veterans ascribed to the pathological gambler category.  
 \*Significant result where  $p < .05$ .

Fuller, Mindell, & Prior, 2016; Scottish Health Survey 2015: Jack, Hinchliffe, Rutherford, & Brown, 2016) clearly limit further research opportunities.

Implications

A higher prevalence rate of problem gambling in the UK armed forces veterans compared with non-veterans establishes a responsibility to examine current prevalence using contemporary measures. Further research, using a larger sample of veterans, should focus on armed forces experience and the influence and impact of the family to extend this study’s findings. If gambling problems persist as a significant issue for the veteran population, then steps must be taken to safeguard these individuals. Increasing awareness of this issue within the veteran population, by both clinical staff and veterans themselves, appears warranted at this stage, especially given the high comorbidity rates between problem gambling and psychiatric disorders (Kessler et al., 2008), and the increase in negative life events and harms that gambling prescribes (Langham et al., 2016).

The novel finding that male veterans were significantly more likely to have been physically abused by their partner than their non-veteran counterparts identifies a further safeguarding issue within this population. In the past, research has not included male veterans as the victims of domestic violence (Ritchie, 2016); our results call for a renewed focus on this overlooked population.

CONCLUSIONS

The UK armed forces veterans have higher prevalence rates of problem gambling than non-veterans, and male veterans are more likely to have been physically abused by their partner than their non-veteran counterparts. Further understanding the role of the family in influencing veterans’ gambling, and the bidirectional impact gambling has on veterans’ families, may facilitate new interventions to tackle this growing public health challenge (Bowden-Jones, 2017). Given the potential implications of these findings for the armed forces population, and the limitations of the 2007 APMS, further contemporary research with a focus on armed forces veterans, their families, and gambling behavior is essential.

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