

Investigating Veterans' Pre-, Peri-, and Post-Deployment Experiences as Potential Risk Factors for Problem Gambling

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Background and aims: Gambling disorder and its comorbid diagnoses are observed at higher rates in military veterans than in the general population. A significant research gap exists regarding the relationships of veterans' life and service experiences to problematic gambling. The present study explored pre-, peri-, and post-deployment factors associated with problem gambling in veterans. *Methods:* Veterans of Operation Iraqi Freedom, Operation Enduring Freedom, and Operation New Dawn ($n = 738$; 463 males, and 275 females) completed questionnaires via structured telephone interview. We conducted bivariate and multinomial logistic regression analyses exploring associations among problem-gambling severity and socio-demographic variables, psychiatric comorbidities, and 10 scales of the Deployment Risk and Resilience Inventory measuring experiences pre-, peri-, and post-deployment. *Results:* Approximately 4.2% of veterans indicated at-risk or probable pathological gambling (ARPG) post-deployment (two or more DSM-IV criteria for pathological gambling). Bivariate analyses found more severe gambling in males, higher frequencies of post-traumatic stress disorder, substance dependence, traumatic brain injury, panic disorder, and depression in veterans with ARPG, and higher general harassment during deployment, and lower social support and more stressful life events post-deployment in those with ARPG. In multivariable models, both post-deployment factors remained significantly associated with ARPG. *Discussion:* The study suggests that problem gambling among veterans is related to service experiences, and particularly to life experiences post-deployment. *Conclusions:* Adverse service and life experiences and lack of social support may contribute to the risk of problem gambling in military veterans. Investigation of how Veterans Affairs clinical settings may serve veterans following deployment to prevent behavioral addictions is warranted.

Keywords: deployment experiences, gambling, military, veterans

INTRODUCTION

Gambling disorder is characterized by recurring gambling behavior that leads to significant impairment and distress in an individual's life (American Psychiatric Association, 2013). Formerly classified as an impulse control disorder, gambling disorder is now classified together with substance use disorders in DSM-5 due to shared features including tolerance, preoccupation, and withdrawal (Potenza, 2014). Prevalence estimates of lifetime gambling disorder range from .2% to 5.3% (Hodgins, Stea, & Grant, 2011).

Significant negative consequences of gambling disorder are observed at both the individual and societal levels. For the individual, the consequences of problem gambling often include financial distress (Boardman & Perry, 2007; Grant, Schreiber, Odlaug, & Kim, 2010), employment problems (Gerstein et al., 1999), relationship issues (Lorenz & Yaffee, 1988), and an increased rate of intra-family abuse, domestic violence, and family neglect (Jacobs et al., 1989). Further, gambling disorder is linked to suicidality. Kausch (2003) reported that nearly 40% of gamblers seeking treatment in a clinical sample reported a previous suicide attempt and that

almost two out of every three of these cases noted gambling as the primary motivator. In support of this notion, Ledgerwood and Petry (2004) noted that almost half of participants from a gambling treatment center reported suicidal ideation and 12% had previously attempted suicide for gambling-related reasons. For its burden on society, gambling disorder and other gambling-related problems, such as illegal acts, lost work time, and bankruptcy, cost the United States an estimated 32 to 53 billion dollars/year, or 165 to 274 dollars/adult/year, depending on prevalence (Grinols, 2004).

In addition, gambling disorder frequently presents with several co-occurring psychiatric disorders. Depression (50%–75%) and substance abuse (25%–63%) may be the most common psychiatric conditions associated with gambling disorder (Crockford & el-Guebaly, 1998; George & Murali, 2005; Kausch, 2003). Generalized anxiety disorder (Black & Moyer, 1998) and antisocial personality (Crockford & el-Guebaly, 1998) are also observed in association with

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gambling disorder, and gambling disorder may predict the onset of post-traumatic stress disorder (PTSD) and substance dependence (Kessler et al., 2008). Conversely, in psychiatric patients, gambling disorder frequently occurs in 6%–12% of individuals (George & Murali, 2005). In sum, gambling disorder as a behavioral addiction represents a significant problem with debilitating consequences.

VETERANS AND GAMBLING

Problem gambling and its correlates represent a significant concern for military veteran populations. Estimates of lifetime gambling disorder and problem gambling in veterans range from ~8.1% of active military personnel (Bray et al., 1999) to upward of 10.7% in treatment-seeking samples (Westermeyer, Canive, Thuras, Oakes, & Spring, 2013). Gambling problems in veterans may frequently go unreported. For example, in a sample of over 1 million veterans receiving VA health services, only .2% was diagnosed with a gambling disorder. The authors suggested that rates may reflect a lack of a system-wide screening effort and that gambling disorder might not fall within the regular scope of practice of mental health practitioners (Edens & Rosenheck, 2012).

Along with higher rates of gambling disorder, other conditions and diagnoses that have been linked to problematic gambling are also common in veterans, suggesting the potential for increased risk in this population. In a large sample of veterans returning from Iraq or Afghanistan seen at Veterans Affairs (VA) health care facilities, approximately one-fourth received a mental health diagnosis and half of these received more than one. Almost 13% were diagnosed with PTSD, while anxiety disorder, depression, and substance-use disorders were observed in 5%–6% (Seal, Bertenthal, Miner, Sen, & Marmar, 2007).

Veterans may be at higher risk of developing gambling disorder because of the relatively high rates of associated co-occurring conditions (Edens & Rosenheck, 2012). However, these identified conditions occur within other populations and may not fully explain the increased rates of gambling disorder in veterans; certain aspects of military service may contribute to the risk of problem gambling and further distinguish this population. For example, major traumatic life events are frequent among those with gambling disorder, and individuals with gambling disorder who experience such traumatic events often experience higher depression, anxiety, avoidance, and drug and alcohol abuse (Taber, McCormick, & Ramirez, 1987). Due to the nature of active military service, veterans are frequently at risk of trauma, potentially contributing to more severe gambling. Similarly, returning veterans experience high rates of mental health and psychosocial problems (Seal et al., 2007), and social support has been found to mediate mental health recovery and resilience in veterans (King, King, Fairbank, Keane, & Adams, 1998). Further, social support has demonstrated an inverse relationship with severity of gambling problems and moderates the effectiveness of gambling treatment (Petry & Weiss, 2009). Thus, low social support upon return from deployment may contribute to disordered gambling in veterans. Because little research has examined relationships among veterans' service experiences and gambling problems, additional efforts are

warranted. Thus, the purpose of the present exploratory study was to investigate potential pre-, peri-, and post-deployment factors related to gambling problems in a national sample of recently returned veterans. We hypothesized that stress- and trauma-related experiences (e.g., pre- and post-deployment stressful life events and general harassment during deployment) would be positively associated with gambling severity, and support (e.g., unit and social support) would be inversely associated with gambling severity.

METHODS

Procedure and participants

The present analysis was conducted with data from the Survey of the Experiences of Returning Veterans (SERV) study, a battery of assessments and questionnaires that examined the post-deployment experiences of Operation Iraqi Freedom, Operation Enduring Freedom, and Operation New Dawn veterans. The general procedures used to recruit participants and conduct the SERV project have been described elsewhere (Smith et al., 2014). Briefly, the SERV recruited veterans, who had served in Afghanistan, Iraq, or surrounding areas via Internet, media, VA, and word-of-mouth solicitation sources. Those eligible to complete the SERV did so by a 60–80 min structured phone interview conducted by trained staff. The project consisted of an initial baseline as well as a 3-month and 6-month follow-up, but all data included in the present analysis were collected at baseline. Nine participants provided incomplete datasets and were removed from further analysis; the final sample consisted of 738 veterans.

Measures

Gambling measures and group assignment. First, participants were asked if they had engaged in any sort of gambling behavior in the past 12 months. Those who reported none skipped any following gambling-related questions of the SERV and were classified as non-gamblers (NG) in the present analysis. Participants who endorsed any kind of gambling behavior then completed an assessment consisting of questions from the Massachusetts Gambling Screen (MAGS; Shaffer, LaBrie, Scanlan, & Cummings, 1994) that targeted the DSM-IV criteria for pathological gambling (MAGS items 16–27). The assessment consisted of 12 items and prompted participants to respond in reference to his or her gambling behavior within the last year. Given that gambling severity lies across a spectrum (Shaffer & Hall, 1996; Toce-Gerstein, Gerstein, & Volberg, 2003), the remaining participants were divided into social-gambling (SG; 0–1 criteria endorsed), at-risk gambling (2–3 criteria endorsed), and probable pathological gambling (4 or more criteria endorsed) groups, as has previously been suggested in the literature (Freimuth, 2005, p. 84) and used in research to study gambling behavior in sub-populations using similar DSM assessments (Ellenbogen, Derevensky, & Gupta, 2007; Gupta & Derevensky, 1998). Due to the limited number of participants endorsing four or more criteria ($n = 19$, 2.6% of the total sample), the at-risk and probable pathological gambling (ARPG) groups were combined.

Socio-demographic characteristics. Participants' genders, ages, ethnicities, education levels, and incomes were assessed at the time of survey administration. Participants (463 male and 275 female veterans) reported an average age of 36 years, ranging from 23 to 68 ($SD = 8.7$). The remaining demographic variables were scored categorically and were reduced to dichotomies due to the limited sample of ARPG subjects ($n = 31$). Criteria for dichotomous categorization were designated based on the available range of responses and common demographic characteristics associated with disordered gambling (Kessler et al., 2008). Race and ethnicity were coded as Caucasian ($n = 574$) and other ($n = 164$). Education was divided by high-school completion, with 87 participants having earned a high-school diploma or less, and 651 reporting education beyond high school. For income, a total of 117 participants reported earning \$20,000 or less per year, and 621 reported earning

more. Further breakdown of socio-demographic variables and their distribution among problem-gambling severity groups are presented in Table 1.

Psychiatric measures. Eight measures of psychiatric comorbidities were included in the present analysis. PTSD was assessed using the PCL-civilian PTSD checklist (Wilkins, Lang, & Norman, 2011). Depression was measured using the Primary Care Evaluation of Mental Disorders (Spitzer, Kroenke, & Williams, 1999). Generalized anxiety, panic disorder, alcohol dependence, and substance dependence were all measured with the Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (Grant & Dawson, 2000; Grant et al., 2003). Traumatic brain injury (TBI) was measured by an assessment frequently utilized by the VA and included items regarding injuries during deployment, not remembering injuries, losing consciousness for more than 20 min,

Table 1. Socio-demographic, psychiatric, and military service characteristics by problem-gambling severity

	NG ($n = 390$; 52.85%)		SG ($n = 317$; 42.95%)		ARPG ($n = 31$; 4.20%)		P
	N or mean	% or SD	N or mean	% or SD	N or mean	% or SD	
Socio-demographic measure							
Ethnicity							
Caucasian	296	75.90	253	79.81	25	80.65	.427
Other	94	24.10	64	20.19	6	19.35	
Gender							
Male	228	58.46	209	65.93	26	83.87	.006
Female	162	41.54	108	34.07	5	16.13	
Education							
High school or less	55	14.10	28	8.83	4	12.90	.095
>High school	335	85.90	289	91.17	27	87.10	
Income							
<20k	68	17.44	42	13.25	7	22.58	.183
20k+	322	82.56	275	86.75	24	77.42	
Age	36.83	9.44	36.50	11.51	36.23	116.87	.851
Psychiatric measure							
PTSD	271	69.49	220	69.40	29	93.55	.016
Anxiety	178	45.64	133	41.96	19	61.29	.102
Panic disorder	146	37.44	130	41.01	20	64.52	.011
Substance dependence	17	4.36	11	3.47	5	16.13	.005
Alcohol dependence	71	18.21	63	19.87	8	25.81	.546
TBI	98	25.13	102	32.18	13	41.94	.031
Depression	116	29.74	97	30.60	22	70.97	<.0001
Mental health services	165	42.31	131	41.32	18	58.06	.196
Military service experience							
Pre-deployment life events	16.25	8.56	17.45	9.17	23.00	8.32	.128
Training and deployment preparation	44.64	18.36	45.04	18.55	41.94	16.96	.330
Deployment environment	48.09	11.23	48.06	10.87	53.52	12.24	.066
Unit support	71.68	19.59	73.08	18.58	68.90	20.98	.501
Relationships during deployment (Gen)	16.29	6.36	15.62	5.89	19.06	6.80	.010
Relationships during deployment (Sex)	9.70	3.27	9.30	3.36	9.97	4.25	.224
Combat experiences	19.11	15.85	18.89	16.93	23.52	12.94	.313
Post-battle experiences	19.74	15.08	18.71	14.77	22.52	12.82	.325
Post-deployment life events	3.91	2.85	3.83	2.59	6.84	3.08	<.0001
Post-deployment support	43.63	10.25	45.11	9.94	36.32	10.63	<.0001

Note. NG = non-gambling; SG = social gambling; ARPG = at-risk/probable pathological gambling; PTSD = post-traumatic stress disorder; TBI = traumatic brain injury; Gen = general harassment; Sex = sexual harassment. Bolded values are statistically significant at $p < .05$.

and concussion symptoms (e.g., headache or dizziness) (Schwab et al., 2006). Last, as a more global assessment of mental health, participants were asked if they had received services for any psychiatric, psychological, emotional, or mental health problem from a VA hospital, a veteran's center, a community health center, or any other mental health provider in the last 90 days. Responses were scored in a yes/no dichotomy.

Military service experiences. The Deployment Risk and Resilience Inventory (DRRI; King, King, Vogt, Knight, & Samper, 2006) quantified veterans' military service experiences. The DRRI is composed of several domains that assess health and well-being measures in military veterans. This measurement has been validated among several military samples and has shown high internal consistency, acceptable test-retest reliability, and evidence of convergent, discriminant, and criterion-related validity (see King et al., 2006; Vogt, Proctor, King, King, & Vasterling, 2008). Scores on 10 scales were included in the analysis. The pre-deployment factor included pre-deployment life events (prior stressors). Domains regarding experiences during deployment included training and deployment preparation (preparedness), deployment environment (difficult living/working environment), unit support (unit social support), relationships during deployment (general harassment), relationships during deployment (sexual harassment), combat experiences, and post-battle experiences (aftermath of battle). Two post-deployment domains included post-deployment support (social support), and post-deployment life events (post-stressors).

Statistical analysis

All analyses were performed using IBM SPSS Statistics 21. To begin, descriptive analyses were conducted to examine differences among NG, SG, and ARPG groups on all socio-demographic, psychiatric, and DRRI measures. One-way analyses of variance (ANOVA) and Pearson χ^2 analyses tested differences in continuous and categorical variables across problem-gambling severity groups, respectively. Next, unadjusted multinomial logistic regression models examined associations between each DRRI score and problem-gambling severity. Due to the limited sample size, each model included only one DRRI variable. Last, each DRRI variable was entered into an individual multinomial logistic regression model adjusted for depression due to the strong relationship between this variable and problem-gambling severity in bivariate analyses and in previous literature (e.g., Crockford & el-Guebaly, 1998; George & Murali, 2005; Kausch, 2003). Further covariates were not included in the adjusted models because of the limitations posed by the overall size of the sample and the low cell counts of veterans with ARPG across demographic and psychiatric variables (e.g., only five veterans with ARPG reported substance dependence). In all regression models, the NG group was entered as the reference category.

Ethics

All procedures of the study were conducted in accordance with the Declaration of Helsinki. The study was approved

by the Institutional Review Board of the Department of VA. All participants were informed about the study and provided written informed consent prior to participation.

RESULTS

Sample characteristics and inter-group differences are displayed in Table 1. Of the 738 veterans, who met the inclusion criteria for the current study, 31 veterans, or 4.20% of the sample, comprised the ARPG group and endorsed at least two gambling-disorder criteria. The SG group consisted of 317 veterans, or 42.95% of the sample, who endorsed fewer than two criteria and reported past-year gambling. The remaining 390 veterans (52.85%) entered the NG group, having indicated no gambling in the past-year. Of the socio-demographic measures, only gender was associated with problem-gambling severity ($\chi^2 = 10.355$, $p = .006$); both SG ($\chi^2 = 4.133$, $p = .042$) and ARPG ($\chi^2 = 7.523$, $p = .006$) groups contained a greater proportion of males than did the NG group. Several psychiatric conditions were associated with problem-gambling severity, including PTSD ($\chi^2 = 8.228$, $p = .016$), panic disorder ($\chi^2 = 8.955$, $p = .011$), substance dependence ($\chi^2 = 10.618$, $p = .005$), TBI ($\chi^2 = 6.925$, $p = .031$), and depression ($\chi^2 = 22.883$, $p < .0001$). More specifically, the ARPG group had significantly higher rates of PTSD ($\chi^2 = 8.058$, $p = .005$; $\chi^2 = 8.092$, $p = .004$), panic disorder ($\chi^2 = 6.486$, $p = .011$; $\chi^2 = 8.553$, $p = .003$), substance dependence ($\chi^2 = 10.513$, $p = .001$; $\chi^2 = 8.172$, $p = .004$), and depression ($\chi^2 = 20.978$, $p < .00001$; $\chi^2 = 21.542$, $p < .00001$) than did the SG and NG groups, and both the ARPG ($\chi^2 = 4.178$, $p = .041$) and SG ($\chi^2 = 4.282$, $p = .039$) groups had significantly higher rates of TBI than the NG group.

Next, three measures of military service experiences were associated with problem-gambling severity. Differences emerged in relationships during deployment [general harassment; $F(2,735) = 4.679$, $p = .010$], post-deployment support, $F(2,735) = 11.057$, $p < .0001$, and post-deployment life events, $F(2,735) = 17.274$, $p < .0001$. Tukey's post hoc analyses found that veterans in the ARPG group scored significantly higher than veterans in the SG ($p < .01$) and NG ($p < .05$) groups on the relationships during deployment measure, lower than both other groups on post-deployment support (all $p < .001$), and higher than both other groups on the post-deployment life events measure (all $p < .0001$).

Results of the multinomial logistic regression analyses are displayed in Table 2. For the unadjusted models, no DRRI scales differentiated SG and NG veterans. When assessing risk for ARPG, results were largely similar to those obtained by bivariate analyses. Pre-deployment life events (OR = 1.016, $p = .049$), deployment environment (OR = 1.034, $p = .023$), relationships during deployment (general harassment; OR = 1.065, $p = .021$), and post-deployment life events (OR = 1.383, $p < .0001$) demonstrated increased odds in relation to ARPG. In contrast, post-deployment support demonstrated decreased odds in relation to ARPG (OR = .939, $p < .001$).

Next, when adjusting for depression, post-deployment support demonstrated increased odds in relation to

Table 2. Odds ratios (OR) for Deployment Risk and Resilience Inventory (DRRI) scales

DRRI scale	SG vs. NG						ARPG vs. NG					
	Unadjusted model			Adjusted model			Unadjusted model			Adjusted model		
	OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI	
Pre-deployment factor												
Pre-deployment life events (0–16)	1.004	.995	1.012	1.004	.995	1.012	1.016*	1.000	1.033	1.010	.992	1.027
Deployment factors												
Training and deployment preparation (13–65)	1.003	.990	1.017	.592	1.004	.990	.979	.948	1.011	.996	.964	1.029
Deployment environment (17–85)	1.000	.988	1.012	.999	.987	1.012	1.034*	1.005	1.064	1.019	.988	1.051
Unit support (20–100)	1.004	.996	1.012	1.004	.996	1.012	.995	.977	1.014	1.003	.985	1.022
Relationships during deployment (Gen; 8–32)	.982	.959	1.007	.981	.957	1.006	1.065*	1.010	1.124	1.038	.981	1.097
Relationships during deployment (Sex; 8–32)	.963	.919	1.009	.962	.918	1.008	1.018	.929	1.116	.993	.905	1.090
Combat experiences (0–85)	.999	.990	1.008	.999	.990	1.008	1.015	.995	1.036	1.007	.985	1.029
Post-battle experiences (0–65)	.995	.985	1.005	.995	.985	1.005	1.012	.989	1.036	1.002	.978	1.026
Post-deployment factors												
Post-deployment support (12–60)	1.015	1.000	1.030	1.017*	1.001	1.034	.939**	.908	.971	.962*	.928	.997
Post-deployment life events (0–14)	.988	.936	1.044	.984	.929	1.043	1.383 [†]	1.222	1.566	1.293**	1.132	1.477

Note. NG = non-gambling; SG = social gambling; ARPG = at-risk/probable pathological gambling; CI = confidence interval; Gen = general harassment; Sex = sexual harassment. Parentheses following DRRI scale titles indicate the range of values on each scale. Adjusted models included depression as a covariate.

* $p < .05$. ** $p < .001$.

[†] $p < .0001$.

SG (OR = 1.017, $p = .033$). Post-deployment life events (OR = 1.293, $p < .001$) demonstrated increased odds in relation to ARPG and post-deployment support (OR = .962, $p = .034$) demonstrated decreased odds in relation to ARPG, but deployment environment and relationships during deployment were no longer related.

DISCUSSION

Little is known about associations between military service experiences and problematic gambling. The present study investigated these relationships in a national sample of veterans. As prevalence estimates of problem gambling in veterans have been high, the results of the present study support and extend findings in the existing literature. To begin, the observed 42.95% rate of veterans who have at least gambled within the previous 12 months and the additional 4.20% frequency of ARPG in the present sample support assertions that gambling represents a concern in this population (Westermeyer et al., 2013) and that a more systematic monitoring of gambling issues is warranted (Edens & Rosenheck, 2012). The data obtained regarding gender were also supportive of previous research in that more severe gambling was more common in males than females (Volberg, 1994). Further, the present study sought to extend the literature by examining relationships between

problem-gambling severity and veterans' service experiences. As may be expected from the frequency of comorbidity between gambling and other psychiatric disorders (Crockford & el-Guebaly, 1998; Desai & Potenza, 2008), the current sample of ARPG veterans demonstrated relatively high frequencies of PTSD, panic disorder, substance dependence, TBI, and depression. When controlling for depression, scores on the measure of pre-deployment life events failed to relate significantly to problem-gambling severity. Of the seven DRRI measures of various aspects of experiences during deployment, two factors – deployment environment and general harassment – related to ARPG in unadjusted models, but not when adjusting for depression. Last, of the two post-deployment measures, both stressful life events and social support were related to ARPG, and post-deployment social support was related to SG when adjusting for depression. More specifically, stressful life events increased the likelihood of ARPG, and social support increased the likelihood of SG but reduced the likelihood of ARPG. Overall, the results of the primary analyses suggest a link between several aspects of military experiences and problem gambling.

The present results have multiple implications for services and assessment. To begin, if gambling problems remain a significant concern for military personnel and veteran populations, efforts to address assessment barriers are important. Increased emphasis on systemic screening for

gambling problems and further awareness by mental health professionals who serve veterans appear warranted. Clinicians should increase awareness of frequent co-morbidity between gambling disorder with other psychiatric conditions as well as the relationship among stressful life events and gambling behavior, such that the presentation of related phenomena may prompt attention to the potential of gambling problems.

Second, gambling treatment programs are few in number for veterans and military personnel (Kennedy, Cook, Poole, Brunson, & Jones, 2005). Evaluation and dissemination of programmatic strategies targeting gambling problems in the context of the unique challenges faced by veterans are warranted by the high rates of past-year gambling and endorsed criteria of gambling disorder. Additional efforts to address stressful life events, such as financial issues, seeking employment, or health problems as well as efforts to increase awareness of available treatment programs, may be particularly valuable. Because social support may be protective against more severe gambling, interventions related to families, community involvement, and social perceptions of veterans and military service may prove an important area of future research and development.

Next, the current results suggest that assessment and treatment developments following the return from service may be particularly important in combating problem gambling. Within the adjusted multinomial models, only post-deployment factors were significantly associated with gambling severity. That is, stressful post-deployment life events, such as violent encounters, injury, legal and financial issues, natural disasters, and significant relationship changes, were associated with ARPG. Further, post-deployment support, such as friends, family, and society providing outlets for talking about deployment experiences, assistance with matters of daily living and other hardships, and emotional support, appears protective against ARPG, but increased the likelihood of SG. However, stressful pre-deployment life events neither did appear to constitute risk factors nor did combat or post-battle experiences while in the military. Similarly, support from one's unit during deployment was not related to problem-gambling severity. Overall, despite the similarity of measures assessing factors across different time frames, the most robust associations with problem-gambling severity were with post-deployment measures.

Although the cross-sectional nature of the study precludes causal inference making, the findings suggest the need for further investigation of differences in environmental and social factors experienced by male and female veterans upon return to more clearly identify factors that prevent and promote disordered gambling and to implement strategies to fortify prevention efforts. For example, a larger sample of veterans would allow for further breakdown of post-deployment DRRI questionnaires to examine individual items most contributing to or protecting against gambling behavior, and this knowledge might then be used to enhance current interventions. In addition, clinicians should be aware of the potential risks posed by stressful events when soldiers return, and, as previous evidence has suggested protective utility of general social support (Petty & Weiss, 2009), clinicians may wish to help veterans with problem gambling in developing a social network to cope

with stressful events or with arranging community support groups.

The present study is not without limitations. First, the sample consisted of relatively few female veterans. Though the SERV (Smith et al., 2014) over-recruited female participants, women represent an increasing proportion of military veterans and future research efforts in veterans' health should include sufficient numbers of women to make meaningful analyses. Second, the sample size in the present study was relatively small and thus, the results should be interpreted with caution. Present analyses included few predictors such that the ratio of cases to predictor variables was consistent with recommendations (see Vittinghoff & McCulloch, 2007), but further replication with a larger sample may increase confidence in the results. Additionally, adjusted multinomial logistic regression models adjusted for depression but not for other factors that may potentially moderate or otherwise relationships with problem-gambling severity. Future studies should recruit a larger sample of veterans with ARPG (and particularly gambling disorder), so that analyses may control for more conditions (or otherwise investigate factors in mediation or moderation models) across groups and further understand possible influences of the deployment factors under examination. Next, all measures were administered via self-report and were presented in a military-service-related context, and veterans may have been more likely to under-report negative behavior. However, participants were informed that responses were confidential, which may reduce the likelihood of false reporting. Additionally, numerous measures were tested across several models, thus inflating the likelihood of finding a significant relationship by chance alone. The present analyses suggest only relationships among the examined variables, and causality cannot be inferred.

CONCLUSIONS

The results of the exploratory analyses showed a positive association between problem-gambling severity and post-deployment stressful life events and suggested a protective relationship between post-deployment social support and gambling in veterans. Clinicians serving veterans should be aware of the potential risk associated with stressful life events following deployment and may wish to bolster treatments with strategies to augment social support. Future research should further investigate how gambling problems develop in veteran populations and how improved identification and treatment of gambling disorder may be implemented and evaluated in returning veterans.

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