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Pathological and Problem Gambling among Veterans in Clinical Care: Prevalence, Demography, and Clinical Correlates

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Background and Objectives: The aim of the study was to estimate prevalence rates of pathological gambling and problem gambling among veterans receiving VA care, since several studies have suggested that VA patients may be at increased risk to these conditions.
Sample: consisted of 1,999 veterans randomly selected from VA centers and community clinics in the Albuquerque and Minneapolis catchment areas. Women and younger veterans were oversampled, due to anticipated low rates in these two groups.
Results: revealed that the lifetime prevalence rate of pathological gambling weighted for current VA patients was 2.0%, twice the general adult population rate. Current 1-year weighted prevalence of pathological gambling was .9%, with an additional .2% having continued problem gambling and .9% recovered. Lifetime weighted problem gambling rate was 8.8%. Altogether, 10.7% had lifetime pathological gambling or problem gambling. Women had higher rates of pathological gambling, but similar rates of problem gambling compared to men. The greater prevalence of pathological gambling for younger veterans aged 20–29 (1.3%) compared to veterans aged 30–39 (.8%) was unusual and warrants further investigation.
Conclusions and Scientific Significance: Veterans in VA care have higher rates of gambling problems than the general adult population. Female and young veterans have rates higher than those observed in other surveys of women and young adults. (Am J Addict 2013;22: 218–225)

INTRODUCTION

Prevalence rates of pathological gambling and problem gambling among veterans seeking veterans administration (VA) health care were increased compared to the general adult population in two previous studies. Among 412 Minnesota veterans receiving VA mental health services, 15% had lifetime pathological gambling and an additional 25% had one or more lifetime gambling symptoms.[1] In an Ohio residential program for homeless veterans with substance use disorders, the lifetime pathological gambling rate was likewise elevated compared to the general adult population at 14% (22/154).[2] Our community survey of American Indian and Hispanic veterans showed lifetime pathological gambling rates of 10% and 7%[3]—the highest rates yet recorded in a community survey. General population studies in the United States have shown adult lifetime pathological gambling prevalence of about 1%.[4–7]

The goal of this research was to determine the prevalence of pathological gambling and problem gambling among veterans using VA health care, including preventive, primary care, and specialty services, in two regions of the United States (Southwest and North Central). The rationale for using a clinical rather than a community sample was to obtain information that would be applicable in VA clinical settings. Specific aims were to: (i) measure the lifetime and current 1-year prevalence rates of pathological gambling and problem gambling, (ii) identify demographic factors associated with pathological gambling and problem gambling, and (iii) assess psychiatric comorbidity associated with pathological gambling and problem gambling. We hypothesized, based on previous reports,[4,5,8–12] that the prevalence rates among veterans would be higher than the general population and correlated with increasing age, male gender, being employed, being married, and any lifetime anxiety, mood, or substance use disorder.

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METHODS

Sample

The sample was drawn randomly from veterans having had at least one preventive, diagnostic, or interventional health care

visit in the two VA regions, the Albuquerque and Minneapolis catchment areas along with their associated Community Based Outpatient Clinics. The sample consisted of 1.8% of veterans receiving care in each setting. Both states possessed access to numerous gambling venues, for example, casinos and lotteries. Rural veterans comprised about 35% of all veterans in both settings. The actual sample consisted of 1,999 veterans; the weighted sample (an arbitrary number computed separately for Minneapolis and Albuquerque) consisted of 1,986. The weighted data calculation was based on (i) the actual number of male and female veterans at each facility and (ii) the actual number of veterans in each age decile at each facility.

The sample of veterans was drawn randomly from over 110,000 patients receiving health care during 2006 and 2007 at these facilities. Data were collected in 2008 and 2009. Women and younger veterans were over-sampled to provide a sufficient number of cases for analysis, since lower rates have been reported in these groups.[12,13] Veterans were invited to participate with one letter, a second letter (if no response to the first letter), and a follow-up telephone call. They provided informed, signed consent for the study. The consent form was approved by both the Minneapolis and Albuquerque VAMC's institutional review boards. To maintain a high response rate, we facilitated research appointments at times when veterans were returning for clinical care; and we provided a stipend for their extra time spent in research-related tasks.

If the veteran conveyed an intent not to participate at any of the invitations, or did not respond to any invitation, the next veteran with the same gender and age on the randomly selected list was invited to participate. We did not collect data on non-participation from the entire group, but the young veterans (who tended to be more difficult to contact due to changing residence and busy schedules) had an acceptance rate of around 80% based on the number who participated. Anecdotal information from veterans contacting us to explain their non-participation provided a wide range of differing rationales with no one dominant theme (eg, too busy at work and school, too feeble or ill to travel to the VA site, change in care venue to a non-VA clinic). Family members of seven veterans contacted us to tell us that their veteran relative was deceased. Five people contacted us from other states and indicated that they had permanently relocated.

Data Collection

The computerized Diagnostic Interview Schedule-IV (C-DIS4)[14] was used for pathological gambling (a diagnosis) and problem gambling (sub-threshold) categories, as well as lifetime psychiatric comorbidity. Five or more of 10 lifetime gambling-related symptoms were needed to qualify for the diagnosis of pathological gambling; see Table 1 for the 10 symptoms. Problem gambling consisted of having one to four gambling symptoms.

Demographic data included age, gender, education, marital status, ethnicity, site (Albuquerque or Minneapolis catchment areas), and employment status (using four categories).

Analysis

Since women and younger veterans were over-sampled, the rates were weighted to represent the actual number of veterans by gender and age in these demographic categories. Separate weighting was estimated for Minnesota and New Mexico due to the different demographic composition of veterans in care in those two areas (ie, more married and more non-Caucasian veterans in New Mexico).

Comparisons were conducted on ten demographic variables and three clinical categories versus (i) presence-versus-absence of lifetime pathological gambling and (ii) any-versus-no lifetime gambling symptoms. Using the conservative Bonferoni correction (due to large sample size and numerous comparisons), cut-off for significance was set at .05/13 variables =.004.

Binary logistic regressions were then run using results from these comparisons, with pathological gambling and any gambling problems as the dependent variables. Those variables showing significance at .1 or less were entered into the two regressions. Level of significance for the regressions was set at .05.

Findings

Weighted Demography and Prevalence Rates

The lifetime prevalence rate of pathological gambling was 2.0%; see Table 1. The current 1-year prevalence rate of pathological gambling was .9%. The lifetime prevalence rate of problem gambling was 8.8%. The combined lifetime prevalence rate of pathological gambling plus problem gambling was 10.7%.

Demography, Lifetime Clinical Comorbidity, and Lifetime Pathological Gambling

In the raw data, 54 veterans met DSM-IV data for lifetime pathological gambling. As shown in Table 2, none of the demographic characteristics bore a significant relationship (at $p < .004$) to lifetime pathological gambling. Those veterans with lifetime mood disorder or substance use disorder were more apt to have lifetime pathological gambling ($p < .001$). Although not reaching statistical significance of $p = .004$, the following variables qualified for entry into the logistic regression model at $p \leq .1$: gender (more women with pathological gambling), disabled (more disabled with pathological gambling), unemployed (more unemployed with pathological gambling), and more veterans with any lifetime anxiety disorder (more lifetime anxiety disorder with pathological gambling).

Among those with any mood disorder, major depressive disorder was significantly associated with pathological gambling (61% vs. 36%), but dysthymia and bipolar disorders were not. None of the anxiety disorders, including PTSD, was associated with pathological gambling.

The logistic regression model demonstrated that those with any lifetime substance use disorder or any lifetime mood disorder were more apt to have had lifetime pathological gambling at $p = .001$ and .01, respectively; see Table 3. Lifetime substance use disorder increased the risk of

TABLE 1. Weighted demographic and gambling data

Variable	Weighted data
Number	1,986
Demography	
Age	
Range	20–91 years
Mean (standard deviation)	62.1 (13.2)
Median	61.0
Skewness	−.50
Gender	
Men	1,838 (92.5%)
Women	148 (7.5%)
Education	
Range	0–40 years
Mean (standard deviation)	14.3 (2.9)
Median	14.0
Skewness	.06
Marital status	
Single	202 (10.1%)
Married	1,230 (61.9%)
Other	554 (27.9%)
Full-time employed	
Present	402 (20.2%)
Absent	1,584 (79.8%)
Retired	
Present	987 (49.7%)
Absent	999 (50.3%)
Disabled	
Present	546 (27.5%)
Absent	1,440 (72.5%)
Unemployed	
Present	130 (5.6%)
Absent	1,856 (94.4%)
Ethnicity	
Caucasian	1,567 (78.9%)
Hispanic	226 (11.3%)
Black	65 (3.3%)
Asian	8 (.4%)
Native American	30 (1.5%)
Other*	71 (3.6%)
Site	
Minnesota	1,219 (61.3%)
New Mexico	767 (38.7%)
Pathological gambling (PG) and problem gambling (pg), with 95% confidence intervals	
Lifetime PG	40 (2.0%, 95% CI 1.4–2.6%)
Current PG	18 (.8%, 95% CI .4–1.2%)
Recovered	17 (.8%, 95% CI .4–1.2%)
Continued pg	5 (.2%, 95% CI .1–.3%)
# Gambling symptoms	
0	1,773 (89.2%, 95% CI 87.8–90.6%)
1	92 (4.6%, 95% CI 3.7–5.5%)
2	41 (2.0%, 95% CI 1.4–2.6%)
3	25 (1.3%, 95% CI .8–1.8%)
4	16 (.8%, 95% CI .4–1.2%)

(*Continued*)

TABLE 1. Continued

Variable	Weighted data
5	4 (.2%, 95% CI .1–.4%)
6	2 (.1%, 95% CI .0–.2%)
7	14 (.7%, 95% CI .3–1.1%)
8	10 (.5%, 95% CI .2–.8%)
9	1 (<.1%, 95% CI .0–.2%)
10	8 (.4%, 95% CI .1–.7%)
Gambling symptoms	
Recouping losses	128 (6.5%, 95% CI 5.4–7.6%)
Preoccupied w/gambling	113 (5.7%, 95% CI 4.7–6.7%)
Escaping from problems by gambling	82 (4.1%, 95% CI 3.2–5.0%)
Increasing bets for excitement	51 (2.6%, 95% CI 1.9–3.3%)
Lying to conceal gambling	63 (3.2%, 95% CI 2.4–4.0%)
Unsuccessful repeated efforts to quit gambling	60 (3.0%, 95% CI 2.2–3.8%)
Jeopardized job or relationship to gamble	33 (1.7%, 95% CI 1.1–2.3%)
Restless/irritable w/cut down in gambling	31 (1.6%, 95% CI 1.1–2.2%)
Relies on others for gambling money	31 (1.6%, 95% CI 1.0–2.2%)
Illegal acts to finance gambling	26 (1.3%, 95% CI .8–1.8%)

*The largest group was American Indians reporting another ethnicity.

pathological gambling by 3.11 times (95% confidence interval: 1.75–5.53). Lifetime mood disorder increased the risk of pathological gambling by 2.42 times (95% confidence interval: 1.23–4.74).

Demography, Lifetime Clinical Comorbidity and Combined Pathological + Problem Gambling

As shown in Table 4, no demographic characteristic was associated with combined lifetime pathological gambling and problem gambling.

All three categories of lifetime psychiatric disorders, that is, any mood, anxiety, and substance use disorders, were more prevalent in the problem/pathological gambling group. Among the anxiety disorders, only social phobia was more common in those with any gambling problems (8% vs. 16%, $X^2 = 16.08$, $p < .001$). None of the separate mood disorders showed a significant association with problem gambling.

Variables meeting the .1 cut-off for the logistic regression model were as follows: more non-White ethnicity, and more likelihood of lifetime mood, anxiety, or substance use disorder. The logistic regression model produced two variables associated with combined pathological gambling plus problem gambling (see Table 5). Again, lifetime mood disorder and lifetime substance use disorder were associated with combined pathological gambling plus problem gambling (at .004 and .001, respectively).

DISCUSSION

Weighted Rates

The weighted lifetime rate of pathological gambling (ie, 2.0%) was twice the usual adult lifetime prevalence rate of around 1%.[4,12,15,16] The weighted 1-year rate of pathological gambling (1.5%) was also higher than the usual rates, which range between .5% and 1.0%.[4,13] Thus, veterans receiving care at the Albuquerque and Minneapolis catchment areas had about twice the usual adult prevalence rates of pathological gambling.

The weighted lifetime prevalence of problem gambling was also high (8.8%) compared to other surveys of adults that run around 1–2%.[6,15] The ratio of problem gambling to pathological gambling in this sample was 8.8–2.0, or 4.4–1. In mature populations exposed to gambling venues over a few decades, the ratio of problem gambling/pathological gambling has been less, in the range of 1 or 2 problem gamblers to 1 pathological gambler, that is, 1 or 2–1.[3,17] The 4.4 ratio in this sample suggests either of two alternatives: that is, (i) a large number of those veterans with problem gambling might, over time, progress to pathological gambling; or (ii) the ratio of problem gambling to pathological gambling among veterans is atypically higher than ratios observed in other groups. These data do not reveal which alternative is more likely; repeated study over time should reveal whether an epidemic of pathological gambling is enfolding among veterans, or whether veterans differ from other groups in having a relatively high proportion of problem gambling.

Demography and Gambling Problems

We oversampled women due to numerous reports indicating lower rates of pathological gambling in women as compared to men,[4,11,13,18] anticipating a need for more women in order to determine prevalence rates. Contrary to our expectation, these data revealed a high rate of pathological gambling in female veterans. Our earlier study of American Indian and Hispanic veterans surprisingly indicated rates of pathological gambling in women that did not differ from those of men.[3] Volberg[19] has also posited a possible increase in gambling and related

TABLE 2. Demography and lifetime DSM-IV diagnoses versus lifetime pathological gambling lifetime data

Variables	Pathological gambling		Statistics
	Absent	Present	
Number	1,945	54	
Demographic characteristics			
Age	51.6 (15.6)	51.3 (11.7)	$t = .22$, 59.1 df*, $p = .83$
Gender			
Women	664 (34%)	25 (46%)	$X^2 = 2.91$, 1 df
Men	1,281 (66%)	29 (54%)	$p = .09$
Education (in years)			$t = .16$, 1,992 df
Mean (standard deviation)	14.6 (2.9)	14.7 (2.1)	$p = .87$
Ethnicity			
Euroamerican	1,520 (78%)	40 (74%)	$X^2 = .30$, 1 df
All other	425 (22%)	14 (30%)	$p = .59$
Marital status			
Single	375 (19%)	10 (19%)	$X^2 = .56$, 2 df
Married	943 (49%)	24 (44%)	$p = .76$
All other	627 (32%)	20 (37%)	
Full-time employed			
Present	563 (29%)	12 (22%)	$X^2 = .88$, 1 df
Absent	1,378 (71%)	42 (78%)	$p = .35$
Retired			
Present	557 (29%)	11 (20%)	$X^2 = 1.41$, 1 df
Absent	1,384 (71%)	43 (80%)	$p = .24$
Disabled			
Present	593 (31%)	23 (43%)	$X^2 = 3.08$, 1 df
Absent	1,348 (69%)	31 (57%)	$p = .08$
Unemployed			
Present	183 (9%)	10 (18%)	$X^2 = 4.00$, 1 df
Absent	1,758 (91%)	44 (82%)	$p = .05$
Site			
Minnesota	1,199 (60%)	34 (63%)	$X^2 = .65$
New Mexico	770 (40%)	20 (37%)	$p = .42$
Lifetime diagnoses			
Mood disorder	825 (42%)	39 (72%)	$X^2 = 17.80$, 1 df, $p < .001$
Anxiety disorder	732 (38%)	30 (57%)	$X^2 = 6.40$, 1 df, $p = .01$
Substance use disorder	492 (25%)	30 (57%)	$X^2 = 26.36$, 1 df, $p < .001$

*In the *t*-test for age, the distribution of variances in the two groups was significantly different, leading to use of an unpooled rather than pooled variance in the analysis.

TABLE 3. Logistic regression model predicting lifetime pathological gambling

Variables	*B* (SE)	Wald	Signif.	Exp(*B*)	95% CI
Substance use disorder/LT	1.14 (.29)	15.01	.001	3.11	1.75–5.53
Mood disorder/LT	.88 (.34)	6.58	.01	2.42	1.23–4.74
Gender	−.51 (.29)	3.14	.08	.60	.34–1.06
Unemployed	.30 (.18)	2.68	.10	1.35	.94–1.94
Disabled	.12 (.15)	.66	.42	1.12	−.85 to 1.49
Anxiety disorder/LT	−.01 (.32)	.00	.99	.99	.54–1.85
Constant	−3.39 (.80)	18.13	.001	.03	—

TABLE 4. Demography and lifetime DSM-IV diagnoses versus problem + pathological gambling lifetime data

Variables	Problem + pathological gambling		Statistics
	Absent	Present	
Number	1,788	211	
Demography			
Age	51.6 (15.6)	52.0 (14.4)	$t = .36$, 1,997 df, $p = .72$
Gender			
Women	619 (35%)	71 (34%)	$X^2 = .04$
Men	1,169 (65%)	140 (66%)	$p = .84$
Education			
Mean (standard deviation)	14.6 (2.9)	14.4 (2.7)	$t = .30$, 1,993 df, $p = .76$
Ethnicity			
Euroamerican	1,406 (79%)	154 (73%)	$X^2 = 3.19$
All other	382 (21%)	57 (27%)	$p = .07$
Marital status			
Single	347 (19%)	39 (19%)	$X^2 = 1.83$, 2 df, $p = .40$
Married	872 (49%)	95 (45%)	
All other	570 (32%)	77 (37%)	
Full-time employ			
Present	525 (29%)	51 (24%)	$X^2 = 2.29$
Absent	1,259 (71%)	160 (83%)	$p = .13$
Retired			
Present	513 (29%)	56 (27%)	$X^2 = .35$
Absent	1,271 (71%)	155 (74%)	$p = .55$
Disabled			
Present	541 (30%)	75 (36%)	$X^2 = 2.17$
Absent	1,243 (70%)	136 (65%)	$p = .14$
Unemployed			
Present	167 (9%)	26 (12%)	$X^2 = 1.57$
Absent	1,617 (91%)	185 (88%)	$p = .21$
Site			
Minnesota	1,088 (61%)	120 (57%)	$X^2 = 1.09$
New Mexico	700 (39%)	91 (43%)	$p = .30$
Lifetime diagnoses			
Mood disorder	752 (42%)	113 (54%)	$X^2 = 9.70$, $p = .002$
Anxiety disorder	654 (37%)	108 (51%)	$X^2 = 16.46$, $p < .001$
Substance use disorder	445 (25%)	78 (37%)	$X^2 = 13.64$, $p < .001$

TABLE 5. Logistic regression model predicting problem + pathological gambling

Variables	*B* (SE)	Wald	Signif.	Odds ratio	95% CI
Substance use disorder/LT	1.09 (.29)	14.18	.001	2.97	1.68–5.22
Mood disorder/LT	.99 (.34)	8.46	.004	2.69	1.38–5.24
Anxiety disorder/LT	.08 (.31)	.07	.79	1.09	.59–2.00
White versus other	−.13 (.16)	.64	.42	.88	.64–1.20
Constant	−4.42 (.37)	144.46	.001	.01	—

problems among women. Taken together, these findings suggest that female veterans have an increased risk to pathological gambling compared to other women in society, apparently as high as male veterans.

We oversampled younger veterans due to numerous reports indicating lower rates of pathological gambling in non-veterans under the age of 30 or 40 compared to people over the age of 40 or 50.[11,17,20] Unexpectedly, we did not confirm the usual direct

relationship of pathological gambling (or combined problem gambling + pathological gambling) to increasing age.

Clinical Correlates of Gambling Problems

The binary analyses in this study confirmed the association of mood, anxiety, and substance use disorders with pathological gambling with and without problem gambling. However, multivariate analyses revealed the strongest association with substance use disorders, followed by mood disorders. Anxiety disorders were not independently associated with pathological gambling and problem gambling in the multivariate disorders.

Other studies have shown a strong association of gambling problems with externalizing or behavior disorders.[10,20] By the same token, mood symptoms have also shown a consistent association with problem gambling, perhaps even stronger than the association of mood and substance use symptoms. For example, in their clinical study, Castellani et al.[2] also found increased mood symptoms in those with gambling problems, when compared to substance abusing veterans without gambling problems.

Anxiety disorders have also shown association with gambling problems. For example, posttraumatic stress disorder (PTSD) and combat exposure have favored the development of later gambling problems in some studies,[21,22] but PTSD was not associated with increased problem gambling or pathological gambling in this sample. Moreover, in this study anxiety disorders did not show an independent association with pathological gambling with or without problem gambling on multivariate analysis.

Limitations, Strengths, and Implications of the Study

The inclusion of only those veterans receiving VA care encompasses both strength and limitations. On one hand, these data inform us about the gambling characteristics of veterans in VA care—a group for whom interventions might be developed. On the other hand, these findings may not extrapolate to veterans not receiving VA care.

Both Minnesota and New Mexico have high access to casino and other gambling venues. The findings may not extrapolate to areas with low access to gambling venues (although such areas are becoming sparse).

Educational level predicted higher gambling problems in our earlier community study of veterans, perhaps due to more disposable income.[23] However, education did not predict pathological gambling or problem gambling in this study. The reason for this difference is not evident.

We have not addressed the possible role of the Iran and Afghanistan military operations in increasing problem gambling and/or pathological gambling among younger and female veterans. We plan to undertake such an analysis subsequently with these and other data available to us.

CONCLUSIONS

The prevalence rates of gambling problems and pathological gambling among veterans receiving VA health care exceeded those rates reported in the general population by two to four times. Compared to other populations, female and younger veterans were at particular high risk. In addition, the proportion of problem gamblers to those with pathological gambling was high, suggesting that (i) many veterans may still be in the early stages of their problematic gambling careers and (ii) the prevalence of pathological gambling may yet increase notably among veterans in the coming years. These findings imply that the VA health care system should consider screening for problem gambling and pathological gambling. Developing low-cost, efficacious, preventive interventions is also warranted.

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

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