Depression Rates Among Veterans by Different Conflict Eras

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Background

- Depression and anxiety are the most common mental health disorders
- About 60M people and nearly 50% of US adults will develop mental illness at least once during their lifetime
- Economic burden of mental illness in the US totaled about $300 billion in 2006, making it the third costliest medical condition
- Depression is common among veterans and past studies have focused on substance abuse, gender differences and obesity
- Little research has been done in the prevalence and risk factors for depressive symptoms in a sample of military veterans serving during the major conflicts/wars in U.S. history

Objectives

- Examine the prevalence and risk factors for depressive symptoms in a sample of military veterans serving during the major conflicts/wars in U.S. history
- Examine if the prevalence of depression in veterans varies across different wartime periods

Methods

- Design and Participants
  - Data from 2012 Behavioral Risk Factor Surveillance System (BRFSS), a cross-sectional random-digit-dialed telephone survey of 497,691 non-institutionalized adult population aged 18 years or older in the US
  - Sample: 24,087 veterans that participated in major conflicts
- Measures
  - Dependent variable: Self-reported depression diagnosis
  - Risk factor: Wartime period – World War II (WW II), Korean War, Vietnam War, and Gulf War (First and Second)
  - Confounders: socio-demographic factors, BMI, Smoking and Drinking status
- Statistical Analysis
  - Chi-Square test
  - Binary Logistic Regression
  - SAS version 9.4 SurveyFreq and SurveyLogistic Procedures – to account for complex sample design of BRFSS

Results

Table 1: Sample Characteristics by Depression

Variables	Yes Depression n(%)	No Depression n(%)	p-value
Age Group (years)			<.0001
Age 18 – 24	31 (9.4)	187 (11.7)	
Age 25 – 34	54 (16.2)	280 (17.5)	
Age 35 – 44	59 (17.7)	285 (17.8)	
Age 45 – 54	75 (22.5)	300 (18.8)	
Age 55 – 64	67 (20.1)	255 (16.0)	
Age ≥ 65	47 (14.0)	290 (18.2)	
Gender			<.0001
Male	128 (38.3)	854 (53.5)	
Female	206 (61.7)	744 (46.6)	
Ethnicity			<.0001
Caucasian	239 (71.6)	1038 (64.9)	
Non-Caucasian	94 (28.4)	560 (35.1)	
Marital Status			<.0001
Married	140 (42.0)	850 (53.2)	
Widowed/Divorced/Separated	94 (28.3)	289 (18.1)	
Never Married	99 (29.7)	459 (28.7)	
Education			<.0001
Graduated College/Tech School	70 (21.2)	457 (28.6)	
Attended College/Tech School	110 (32.9)	494 (30.9)	
Graduated High School	93 (27.9)	447 (28.0)	
Did not Graduate High School	60 (18.0)	200 (12.5)	
Income Level			<.0001
Less than $15,000	75 (22.6)	174 (10.9)	
$15,000 – $25,000	75 (22.6)	271 (17.0)	
$25,000 – $35,000	37 (11.1)	175 (11.0)	
$35,000 – $50,000	40 (12.1)	234 (14.7)	
$50,000 or higher	105 (31.6)	743 (46.5)	
Body Mass Index (BMI)			<.0001
Normal or Under Weight	104 (31.1)	580 (36.3)	
Overweight	106 (31.7)	592 (37.0)	
Obese	124 (37.2)	426 (26.7)	
Smoking Status			<.0001
Never-Smoker	139 (41.7)	932 (58.3)	
Former Smoker	91 (27.3)	399 (25.0)	
Current Smoker	103 (31.0)	266 (16.7)	
Drinking Status			<.0001
No	169 (50.5)	687 (43.0)	
Yes	165 (49.5)	911 (57.0)	
Veteran Status			<.0001
No	300 (89.7)	1407 (88.0)	
Yes	34 (10.3)	191 (12.0)	

n – weighted frequencies per 100,000
% – weighted percentages

Table 2: Summary of the Univariate and Multivariate logistic regression model predicting Depression

Variables	cOR (95% CI)	aOR (95% CI)
Gender		
Male	1	1
Female	1.72 (1.38 – 2.14)**	1.86 (1.48 – 2.34)**
Ethnicity		
Caucasian	1	1
Non-Caucasian	0.97 (0.82 – 1.15)^	0.81 (0.68 – 0.96)*
Marital Status		
Married	1	1
Widowed/Divorced/Separated	1.74 (1.51 – 2.02)**	1.25 (1.06 – 1.48)*
Never Married	0.97 (0.79 – 1.19)^	0.71 (0.56 – 0.91)*
Education		
College or Technical School Graduate	1	1
Some College or Technical School	1.65 (1.40 – 1.93)**	1.11 (0.94 – 1.32)^
High School Graduate	1.43 (1.22 – 1.69)**	0.91 (0.76 – 1.09)^
Less than High School Graduate	1.90 (1.41 – 2.56)**	1.08 (0.75 – 1.55)^
Income Level		
$50,000 or higher	1	1
$35,000 – $50,000	1.48 (1.22 – 1.80)**	1.48 (1.20 – 1.84)**
$25,000 – $35,000	1.64 (1.32 – 2.03)**	1.75 (1.38 – 2.22)**
$15,000 – $25,000	2.22 (1.85 – 2.67)**	2.29 (1.83 – 2.87)**
Less than $15,000	3.86 (3.11 – 4.80)**	3.38 (2.60 – 4.39)**
Body Mass Index (BMI)		
Normal or Under Weight	1	1
Overweight	1.03 (0.87 – 1.22)^	1.11 (0.93 – 1.32)^
Obese	1.43 (1.21 – 1.70)**	1.36 (1.14 – 1.63)**
Smoking Status		
Non-Smoker	1	1
Former Smoker	1.64 (1.40 – 1.92)**	1.72 (1.45 – 2.03)**
Current Smoker	2.91 (2.43 – 3.48)**	2.32 (1.91 – 2.82)**
Drinking Status		
No	1	1
Yes	0.65 (0.57 – 0.75)**	0.68 (0.59 – 0.79)**
Conflict Era		
World War II	1	1
Korean War	0.85 (0.66 – 1.10)^	0.93 (0.71 – 1.21)^
Vietnam War	2.72 (2.18 – 3.39)**	3.13 (2.43 – 4.05)**
First and Second Gulf War	1.76 (1.38 – 2.25)**	2.55 (1.90 – 3.43)**

cOR = Crude Odds Ratio   aOR = Adjusted Odds Ratio   CI = Confidence Interval
** p-value < 0.01   * p-value < 0.05   ^ non-significant

Veterans serving during the Vietnam War and the Gulf War were 3.13 (95% CI, 2.43 – 4.05) and 2.55 (95% CI, 1.90 – 3.43), respectively, times more likely to have depressive symptoms than those serving during the WW II after adjusting for other variables (Table 2)

Conclusions and Implications

- The prevalence of depression among veterans (10.3%) from this study was found to be lower than in the general population (15.5%)
- Increased prevalence of depression was found in veterans who had lower income, were unmarried, obese, female or current or former smokers
- Depression rates in veterans varies across different wartime periods, with the highest prevalence found in Vietnam War and Gulf War time periods after adjusting for gender, race, marital status, income level, education level, BMI, smoking and drinking status

Strengths and Limitations of Study:
- Strength: First study to look at association between conflict era and depression rates
- Limitation:
  - Self-reported depression diagnosis and veteran status
  - Wartime period was defined using age as opposed to documented military records

Implications for the Field of Public Health:
- Future research should used physician diagnosed depression and actual veterans data
- Understanding the burden of depression among serving different wartime periods may facilitate efficient and effective treatment and allocation of resources