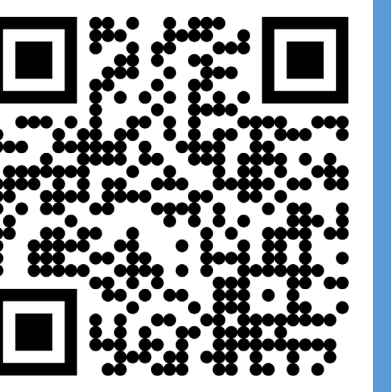


# Mood Functioning in Gulf War Veterans:

Findings from the Boston, Biorepository, Recruitment and Integrative Network (BBRAIN) for Gulf War Illness

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## Background

- About a third of veterans of the 1990-91 Gulf War are suffering from Gulf War Illness (GWI)
- GWI is a multi-symptom disorder that includes chronic fatigue, pain, gastrointestinal problems, cognitive decrements and *mood problems*
- The Boston, Biorepository, Recruitment and Integrative Network (BBRAIN) for GWI stores data on GWI to be used in future analyses

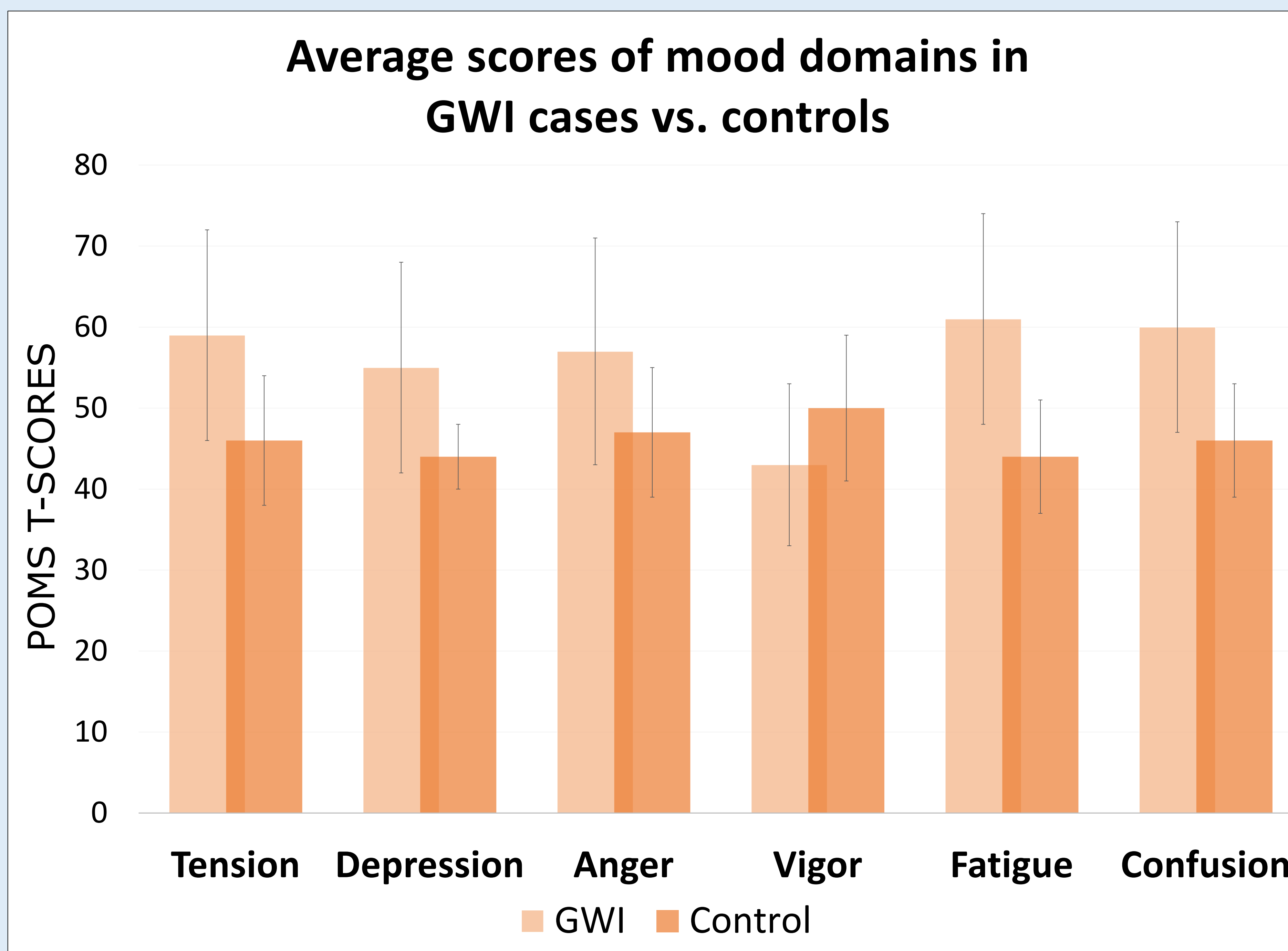
## Objective

Use BBRAIN data to examine self-reported mood and mental health diagnoses between veterans with GWI and healthy controls in a large cohort

## Methods

- 159 veterans deployed to the 1990-91 Persian Gulf War were enrolled in the BBRAIN study
- All participants completed a 65-item Profile of Mood States Second Edition (POMS) questionnaire, profiling their mood state for the past week in 6 domains. Participants also reported if they had been diagnosed with PTSD or depression on a medical conditions questionnaire
- GWI case status was defined by the Kansas GWI criteria
- Two sample t-test was used to examine differences in mood disturbances and chi-square was used for analysis of PTSD and depression

Gulf War veterans with GWI had significantly worse mood scores in the domains of tension, depression, anger, vigor, fatigue and confusion compared to healthy controls. In addition, GWI cases had significantly higher odds of reporting depression and PTSD diagnoses.



**Table 2. Odds Ratios of diagnosis of depression and PTSD for veterans with Gulf War Illness vs. healthy controls**

Medical Condition	OR	95% CI	P-value*
Depression (GWI v. control)	9.2	3.03, 27.91	<0.001
PTSD (GWI v. control)	2.74	1.19, 6.32	0.016

\*chi-square p<0.05

**Table 1. Demographics of GW veteran sample**

	Overall N=189	GWI Cases N=157	Controls N=32	
<b>Age mean(SD)</b>	57(7)	56(6)	59(9)	
<b>Sex</b> n(%)	<b>Male</b>	159(85.5)	129(83.8)	30(93.8)
	<b>Female</b>	27(14.5)	25(16.2)	2(6.3)
<b>Race</b> n(%)	<b>White</b>	144(77.8)	117(76.5)	27(84.4)
	<b>Black</b>	24(13)	21(13.7)	3(9.4)
	<b>Other</b>	17(9)	15(9.6)	2(6.3)
<b>Highest level of Education</b> n(%)	<b>High School</b>	19(10.1)	17(10.8)	2(6.3)
	<b>Some college</b>	69(36.5)	17(10.8)	9(28.1)
	<b>Bachelor's Degree</b>	36(19.6)	27(17.8)	9(28.1)
	<b>Advanced Degree</b>	47(25.5)	35(23)	12(37.5)

## Results

- GWI cases reported significantly higher mood complaints than control veterans on POMS 2 domains including tension, depression, anger, vigor, fatigue and confusion
- GWI cases were 9 times more likely to report being diagnosed with depression compared to healthy controls. This association was statistically significant
- GWI cases were more than twice as likely to report being diagnosed with PTSD when compared with healthy controls. This association was also statistically significant

## Conclusions

Future research should consider mood outcomes when comparing deployment-related exposures

## Acknowledgements

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