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Women at War: Gender Differences in War-Zone Stressors and Postdeployment Mental Health among U.S. OEF/OIF Veterans

Dawne Vogt, PhD & Amy Street, PhD

**Women's Health Sciences Division, NCPTSD,
VA Boston Healthcare System &
Division of Psychiatry, Boston University
School of Medicine**



ADVANCING SCIENCE AND PROMOTING UNDERSTANDING OF TRAUMATIC STRESS



Presentation Structure

- Presentation of Study #1
- Presentation of Study #2
- Discussion and Q&A

Presentation #1: Gender Differences in Combat-Related Stress Exposure and Postdeployment Mental Health

Dawne Vogt, Ph.D.,
Women's Health Sciences Division
National Center for PTSD
VA Boston Healthcare System

Rachel Vaughn, Mark Glickman, Mark Schultz
Mari-Lynn Drainoni, Rani Elwy, & Susan Eisen

in press at *Journal of Abnormal Psychology*



ADVANCING SCIENCE AND PROMOTING UNDERSTANDING OF TRAUMATIC STRESS



Introduction

- Female service members have experienced unprecedented levels of combat exposure in U.S. wars in Afghanistan and Iraq
 - Women's expanded role in the military
 - Enemies' increased use of guerilla warfare tactics
- Great deal of attention in the popular media, but so far little empirical attention
 - Most OEF/OIF studies thus far have not reported gender-specific analyses, but this is changing
 - No in-depth evaluation of gender differences in nature and severity of combat experiences

Introduction



- Anecdotal evidence indicates that female OEF/OIF service members have experienced combat exposure at high levels
- Some evidence that levels of combat exposure for OEF/OIF-deployed women not that different from OEF/OIF-deployed men
 - 45% women vs. 50% men in national sample reported some combat exposure (Jacobson et al., 2008)
 - Among Iraq-deployed combat support troops (Hoge, Clark, & Castro, 2007):
 - 47% men vs. 36% women report firefights
 - 15% men vs. 7% women report shooting at the enemy
 - 38% women vs. 29% men report handling human remains

Relevant Literature

- Women's increased exposure to combat raises question of whether there are gender differences in mental health consequences of combat exposure
 - Broader literature indicates women are at higher risk for mental health problems following variety of traumatic events (Tolin & Foa, 2006)
 - Literature based primarily on noncombat traumas and combat trauma samples from prior cohorts
 - Effect smaller when limited to combat trauma samples
- Some recent evidence that combat may impact women more negatively than men
 - Focus on extreme ends of the combat and PTSD spectrums

Current Study



- Focus of current study
 - Examine gender differences in combat-related stressors in a representative sample of OEF/OIF service members
 - Examine gender differences in combat stressor - postdeployment mental health associations
- Study builds on prior research:
 - Focuses on sample with sufficient dispersion in women's combat exposure for gender comparisons across comparable levels of combat
 - More fine-grained approach to conceptualizing combat-related stress and mental health than most studies
 - Application of sampling design and nonresponse bias weights to produce results that are optimally representative of the larger population
 - Attention to both statistical and clinical significance

Current Study

- Primary Hypotheses

- Men expected to report slightly higher exposure to combat-related stressors
- Combat-related stressors expected to be more strongly associated with postdeployment mental health problems for women, but effect expected to be small

Method

- National sample of 340 female and 252 male OEF/OIF Veterans within one year of returning from deployment (2009)
 - Sample stratified on gender and Active Duty vs. NG/Reservist status
- Application of modified Dillman et al. (2009) approach to mail survey data collection
- Completed mail surveys received from 57% of those confirmed to have received survey materials

Sample Characteristics

- Background Characteristics

- Mean age at time of survey was 34 years (SD = 9)
- 75% Caucasian, 18% African-American, 9% other
- 12% of the sample identified as Hispanic or Latino
- 42% Active Duty, 28% National Guard, 30% Reservist
- 58% Army, 21% Air Force, 17% Navy, 4% Marines
- 69% OIF, 31% OEF
- 88% still in military

- Several gender differences on demographic/military characteristics:

- Female veterans slightly younger than male veterans
- Male veterans more likely to be married
- Male veterans more likely to be living with children
- Men reported higher salaries than women
- Men more likely to have served in Marines

Measures of Combat-Related Stressors

Combat Exposure: Traditional warfare experiences such as firing a weapon, being fired on, going on missions and patrols

Aftermath of Battle: Exposure to consequences of combat, including experiences such as observing human remains and dealing with prisoners of war/detainees

Perceived Threat: Fear for one's safety/well-being in the war zone, especially as response to exposure to circumstances of combat

Difficult Living and Working Environment: Exposure to repeated or day-to-day irritations and pressures related to life in the war zone



Measures of Postdeployment Mental Health

Posttraumatic Stress Symptomatology: military version of the PTSD Checklist (PCL)

Depression and Substance Abuse: Two of the six Behavior and Symptom Identification Scale (BASIS-24) subscales used to assess depression/functioning and substance abuse

Mental Health Functioning: The Veterans RAND Short Form (VR-12) used to assess the impact of mental health on daily functioning

Analytical Strategy



- Weighted analyses in STATA software package to adjust for oversampling and nonresponse bias so that results could be projected to the larger population
- Calculated means for all deployment stressor and mental health measures and independent samples *t*-tests to evaluate gender differences

Analytical Strategy (cont.)

- Hierarchical regression using transformed outcome variables to evaluate gender differences in associations between combat-related stressors and postdeployment mental health
 - 16 potential interactions evaluated
- Accounted for effect of prior life stress exposure and exposure to military sexual harassment to isolate unique effects of combat stress exposure

Results

| Study Variables | Women | | Men | | Mean Diff | CI Diff | <i>t</i> | <i>r</i> | CI <i>r</i> |
|--------------------------------------|-------|-----------|-------|-----------|-----------|---------------|----------|----------|-------------|
| | Mean | <i>SE</i> | Mean | <i>SE</i> | | | | | |
| Combat-Related Stressors | | | | | | | | | |
| Combat Exposure | 20.89 | 0.46 | 25.70 | 0.92 | 4.81 | 2.79 – 6.83 | 4.68* | .19 | 0.11-0.26 |
| Exposure to Aftermath of Battle | 22.57 | 0.68 | 25.92 | 0.95 | 3.35 | 1.05 – 5.65 | 2.86* | .12 | 0.04-0.19 |
| Perceived Threat | 39.97 | 0.87 | 41.52 | 0.94 | 1.55 | -0.96 – 4.07 | 1.21 | .05 | -0.02-0.13 |
| Difficult Living/Working Environment | 45.24 | 0.78 | 50.91 | 1.05 | 5.66 | 3.08 – 8.24 | 4.31* | .18 | 0.10-0.25 |
| Other Stressors | | | | | | | | | |
| Prior Life Stressors | 2.97 | 0.21 | 2.30 | 0.22 | -0.67 | -1.26 – -0.8 | -2.22* | .09 | 0.02-0.17 |
| Sexual Harassment/ Assault | 8.95 | 0.23 | 7.34 | 0.12 | -1.61 | -2.12 – -1.09 | -6.15* | .25 | 0.17-0.32 |

* $p < .05$

Results

| Study Variables | Women | | Men | | Mean Diff | CI Diff | <i>t</i> | <i>r</i> | CI <i>r</i> |
|-------------------------------------|-------|-----------|-------|-----------|-----------|--------------|----------|----------|-------------|
| | Mean | <i>SE</i> | Mean | <i>SE</i> | | | | | |
| Postdeployment Mental Health | | | | | | | | | |
| Posttraumatic Stress Symptomatology | 30.16 | 0.99 | 31.34 | 1.26 | 1.19 | -1.96 – 4.33 | 0.74 | .03 | -0.05-0.11 |
| Mental Health Functioning | 40.58 | 0.65 | 40.68 | 0.68 | 0.10 | -1.74 – 1.95 | 0.11 | .00 | -0.07-0.08 |
| Depression | 0.96 | 0.06 | 0.95 | 0.07 | -0.01 | -0.20 – 0.17 | -0.13 | .01 | -0.07-0.08 |
| Substance Abuse | 0.25 | 0.03 | 0.47 | 0.06 | 0.22 | 0.09 – 0.35 | †3.35* | .14 | 0.06-0.21 |

Note. **p* < .05; † indicates X² value

Results

Table 3

Summary of Multiple Regression Analyses Predicting Postdeployment Mental Health

| Variable | <i>B</i> | <i>CI B</i> | <i>SE B</i> | <i>r</i> | <i>CI r</i> |
|--|-----------------|---------------------|--------------------|-----------------|---------------------|
| <i>Posttraumatic Stress Symptomatology</i> | | | | | |
| Step 2[§] | | | | | |
| Gender | 0.04 | -0.31 – 0.38 | 0.17 | 0.01 | -0.08 – 0.09 |
| Combat Experiences X Gender | 0.02 | -0.04 – 0.07 | 0.03 | 0.02 | -0.07 – 0.10 |
| Aftermath of Battle X Gender | - 0.02 | -0.06 – 0.02 | 0.02 | -0.04 | -0.12 – 0.05 |
| Perceived Threat X Gender | 0.01 | -0.03 – 0.04 | 0.02 | 0.01 | -0.08 – 0.10 |
| Difficult Living/Working Environment X Gender | 0.01 | -0.02 – 0.04 | 0.02 | 0.02 | -0.06 – 0.11 |

§Step 1 and the main effects in Step 2 of each regression have been excluded from this table; *p < .05

Table 3 continued

| <i>SF-12 Mental Health Functioning</i> [†] | <i>B</i> | <i>CI B</i> | <i>SE B</i> | <i>r</i> | <i>CI r</i> |
|--|----------|--------------|-------------|----------|--------------|
| Step 2[§] | | | | | |
| Gender | - 0.04 | -0.25 – 0.17 | 0.11 | -0.01 | -0.10 - 0.07 |
| Combat Experiences X Gender | 0.02 | -0.02 – 0.05 | 0.02 | 0.03 | -0.05 - 0.12 |
| Aftermath of Battle X Gender | - 0.02 | -0.05 – 0.01 | 0.01 | -0.05 | -0.14 - 0.03 |
| Perceived Threat X Gender | 0.02 | -0.00 – 0.04 | 0.01 | 0.06 | -0.03 - 0.15 |
| Difficult Living/Working Environment X Gender | - 0.01 | -0.03 – 0.01 | 0.01 | -0.02 | -0.11 - 0.07 |

[†] Due to the transformation of the mental health functioning variable, all results should be interpreted in the opposite direction.

[§]Step 1 and the main effects in Step 2 of each regression have been excluded from this table; *p < .05

Table 3 continued

| <i>Depression</i> | <i>B</i> | <i>CI B</i> | <i>SE B</i> | <i>r</i> | <i>CI r</i> |
|--|---------------|---------------------|-------------|---------------|---------------------|
| Step 2[§] | | | | | |
| Gender | 0.02 | -0.04 – 0.08 | 0.03 | 0.02 | -0.07 – 0.11 |
| Combat Experiences X Gender | 0.00 | -0.01 – 0.01 | 0.01 | 0.02 | -0.07 – 0.10 |
| Aftermath of Battle X Gender | - 0.01 | -0.01 – 0.00 | 0.00 | - 0.04 | -0.13 – 0.04 |
| Perceived Threat X Gender | 0.00 | -0.01 – 0.01 | 0.00 | 0.00 | -0.09 – 0.09 |
| Difficult Living/Working Environment X Gender | 0.01 | -0.00 – 0.01 | 0.00 | 0.05 | -0.03 – 0.14 |

§Step 1 and the main effects in Step 2 of each regression have been excluded from this table; *p < .05

Table 3 continued

| <i>Substance Abuse</i> | <i>B</i> | <i>CI B</i> | <i>SE B</i> | <i>OR</i> | <i>CI OR</i> |
|--|----------------|---------------------|-------------|-------------|--------------------|
| Step 2^s | | | | | |
| Gender | - 0.56 | -1.18 – 0.06 | 0.32 | 0.57 | 0.31 – 1.06 |
| Combat Experiences X Gender | - 0.01 | -0.10 – 0.07 | 0.04 | 0.99 | 0.91 – 1.08 |
| Aftermath of Battle X Gender | - 0.08* | -0.14 – 0.01 | 0.03 | 0.93 | 0.87 – 0.99 |
| Perceived Threat X Gender | - 0.00 | -0.06 – 0.06 | 0.03 | 1.00 | 0.94 – 1.06 |
| Difficult Living/Working Environment X Gender | - 0.00 | -0.07 – 0.06 | 0.03 | 1.00 | 0.94 – 1.06 |

§Step 1 and the main effects in Step 2 of each regression have been excluded from this table; *p < .05

Conclusions



- As expected, men reported slightly more exposure to the three objective warfare exposure variables
- Small effect suggests women's exposure to these stressors may be only slightly lower than men's exposure
- Highlights need for increased attention to women's experiences of combat-related stressors in assessment and treatment of returning OEF/OIF Veterans
 - Other stressors need to be considered as well

Conclusions

- Despite lower combat exposure, women reported similar levels of perceived threat to what was observed for men
 - Possible that women's increased vulnerability to other war-zone stressors may have contributed to women's perceptions of threat (e.g., MST)
 - In addition, given the nature of insurgency warfare, perceptions of threat may not be limited to individuals in combat roles
 - Also possible that the threshold for women to experience threat is lower than for men

Conclusions

- Only one of 16 interactions achieved conventional levels of statistical significance
 - Revealed stronger negative association for men, not women
- Null results difficult to interpret, inclusion of CIs and effect sizes allowed evaluation of clinical significance
 - CIs and effect sizes were small, indicating that lack of statistical significance not due to problem with power
- Overall, findings suggests similar levels of resilience to combat stressors for women and men
 - Consistent with recent commentary by Hoge et al (2007), combat may be great equalizer of risk due to persistent level of threat



Future Directions

- Longitudinal study designs
 - Cross-sectional designs introduce possibility of retrospective recall issues
- Replicate with clinician-administered measures
 - Self-report measures of mental health
- Examination across full deployment timeframe to assess longer-term outcomes
 - Study limited to specific deployment period (2007-2008) and assessment within a year of return from deployment

Take-Home

- Both exposure to combat-related stressors and associated impact on mental health in the year following return from deployment may be more similar than different for female and male OEF/OIF service members
- Contrasts with widely accepted view that women are more vulnerable to trauma exposure than men
- Future research needed to promote better understanding of factors that contribute to similar levels of resilience to combat trauma, as well as limits of phenomenon

For additional citations and/or more information,
please contact:

Dawne Vogt, PhD

Women's Health Sciences Division
National Center for PTSD (116B-3)

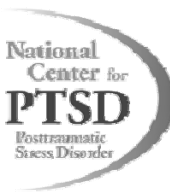
Boston VA Healthcare System

150 South Huntington Ave.

Boston, MA 02130-4893

Dawne.Vogt@va.gov

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Presentation #2:

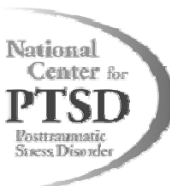
The Role of Gender in the Experiences of Veterans Deployed in Support of the Wars in Afghanistan and Iraq

Amy E. Street, Ph.D.,
Women's Health Sciences Division
National Center for PTSD
VA Boston Healthcare System

Jaimie L. Gradus, Dsc, MPH
Hannah L. Giasson, BA
Dawne Vogt, PhD
Patricia Resick, PhD



ADVANCING SCIENCE AND PROMOTING UNDERSTANDING OF TRAUMATIC STRESS



The Role of Women in the Global War on Terrorism

- The contribution of female service members in OEF/OIF/OND is greater than in any other U.S. conflict.
 - Over 230,000 women have been deployed to Afghanistan and Iraq representing 11.5% of U.S. forces in these conflicts
 - The scope of women's roles in warzone is broader than



Not all Deployment Stressors are Combat-Related

- Being female confers increased risk for experiencing interpersonal stressors during deployment
 - Sexual assault (*Military Sexual Trauma*)
 - Sexual harassment (*Military Sexual Trauma*)
 - Gender-based harassment
 - Lack of support from military peers or leadership

Sexual Trauma During Combat Deployments in Afghanistan and Iraq

- Significant media attention and Veteran reports of sexual trauma to healthcare providers
- Empirical data on experiences of sexual harassment and assault in these war zones was slow in coming
- First published study: 125,729 OEF/OIF Veteran users of VA Healthcare (14% female), using data drawn from VA's electronic medical records
- Among the OEF/OIF cohort:
 - 17.2% women and .8% men experienced sexual trauma
- Compared to Veterans of all cohorts:
 - 21.4% women and 1.1% of men experienced sexual trauma

Exploring the Changing Role of Women in Today's Military

- Women's changing roles in recent combat operations raises important questions-
 - What is the scope of women's exposure to traumatic combat experiences?
 - To what extent are women being exposed to other types of traumatic experiences, e.g., sexual trauma, during deployment?
 - Are women and men differentially impacted by service in the war zone?

The Women at War Survey

- A mail survey of OEF/OIF Veterans designed to answer questions with particular relevance to women Veterans
- Women over-sampled relative to their presence in OEF/OIF
- Men also sampled so that gender differences could be tested



- Measurement focused on the assessment of a wide range of deployment stressors and a number of mental health problems

The Women at War Survey: Sample

- Sampled from VA's Environmental Epidemiology OEF/OIF registry
 - Veterans who had separated from active duty military
 - Veterans who served as Active Duty and as Reserves/Guard
 - Veterans who served over the entire period of service in OEF/OIF
- Followed multiple mailing survey methodology recommended by Dillman (2009)
- Sample size: 2,344 (51% female)
- Response rate: 48.6%
- Responders generally similar to non-responders, with the exception of age
 - Used non-response bias sample weights in all analyses to adjust for differences

Military Service Characteristics

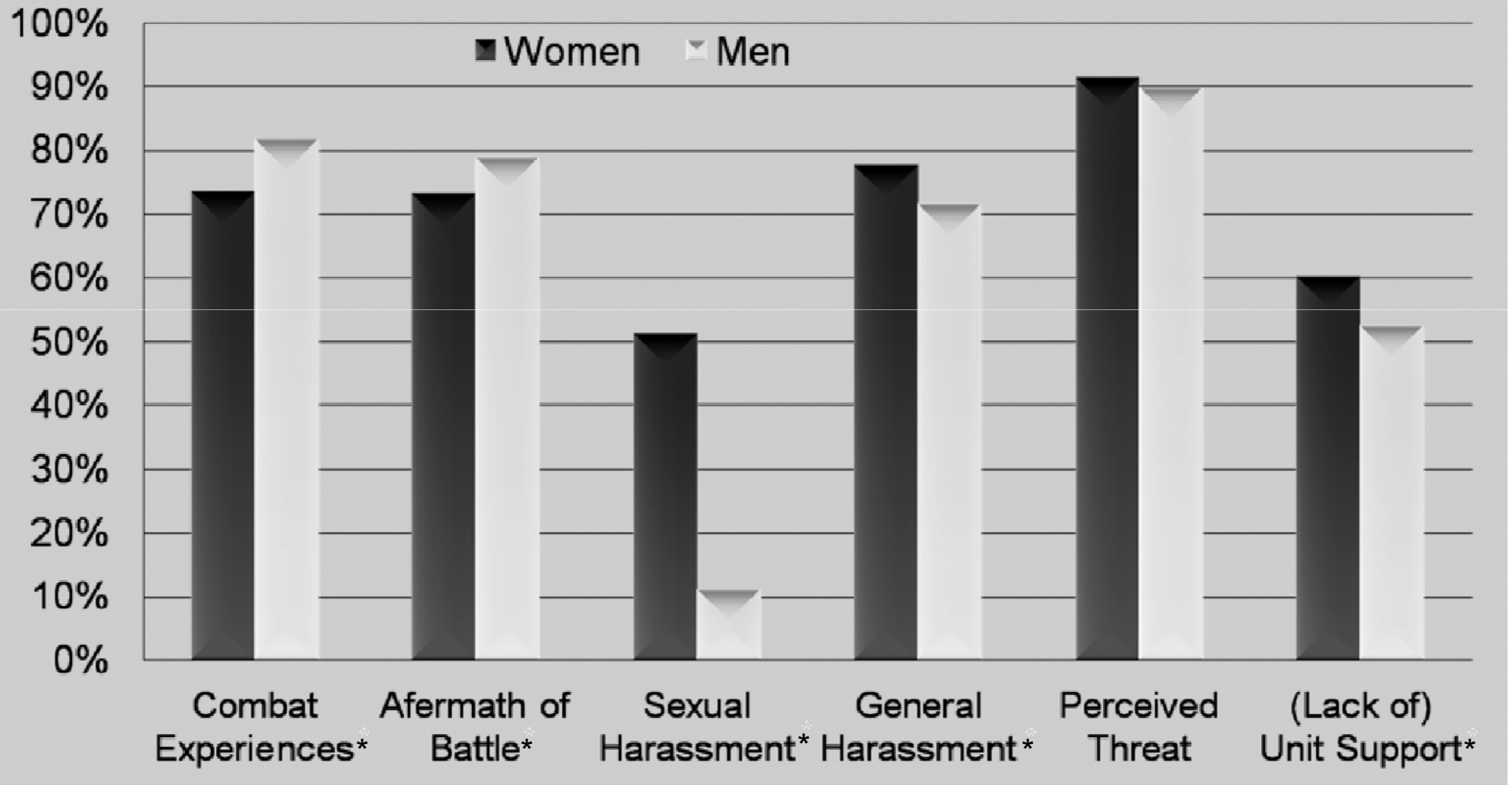
| | Males (n = 1139) | Females (n = 1207) |
|---|---------------------|-----------------------|
| Number of OEF/OIF Deployments* M (SD) | 1.44 (0.76) | 1.33 (0.65) |
| Total Number of Months Deployed to OEF/OIF* M (SD) | 12.17 (8.45) | 10.81 (7.37) |
| Location of Deployment: | | |
| % deployed to Iraq* | 68.7% | 57.3% |
| % deployed to Afghanistan | 14.7% | 12.3% |
| % deployed to "other"* | 28.4% | 37.3% |
| Military Occupation Specialty: | | |
| % served Combat-Arms* | 33.2% | 6.0% |
| % served Combat-Support* | 44.7% | 50.7% |
| % served Service-Support* | 20.8% | 41.0% |

* Denotes a significant difference between genders, $p < .05$

Question of Interest

1. How do male and female military personnel differ in exposure to deployment stressors in the war zone?
 - Are women experiencing combat trauma? How much relative to their male counterparts?
 - Are women experiencing other types of “traditional” deployment stressors? How much relative to their male counterparts?
 - Are women experiencing interpersonal traumas? How much relative to their male counterparts?
 - Do the data look different if you define “exposure to deployment stressors” more liberally or more stringently?

Deployment Stressors: Liberally Defined



.62
(.50,.76)

.73
(.59,.89)

8.7
(6.9,11)

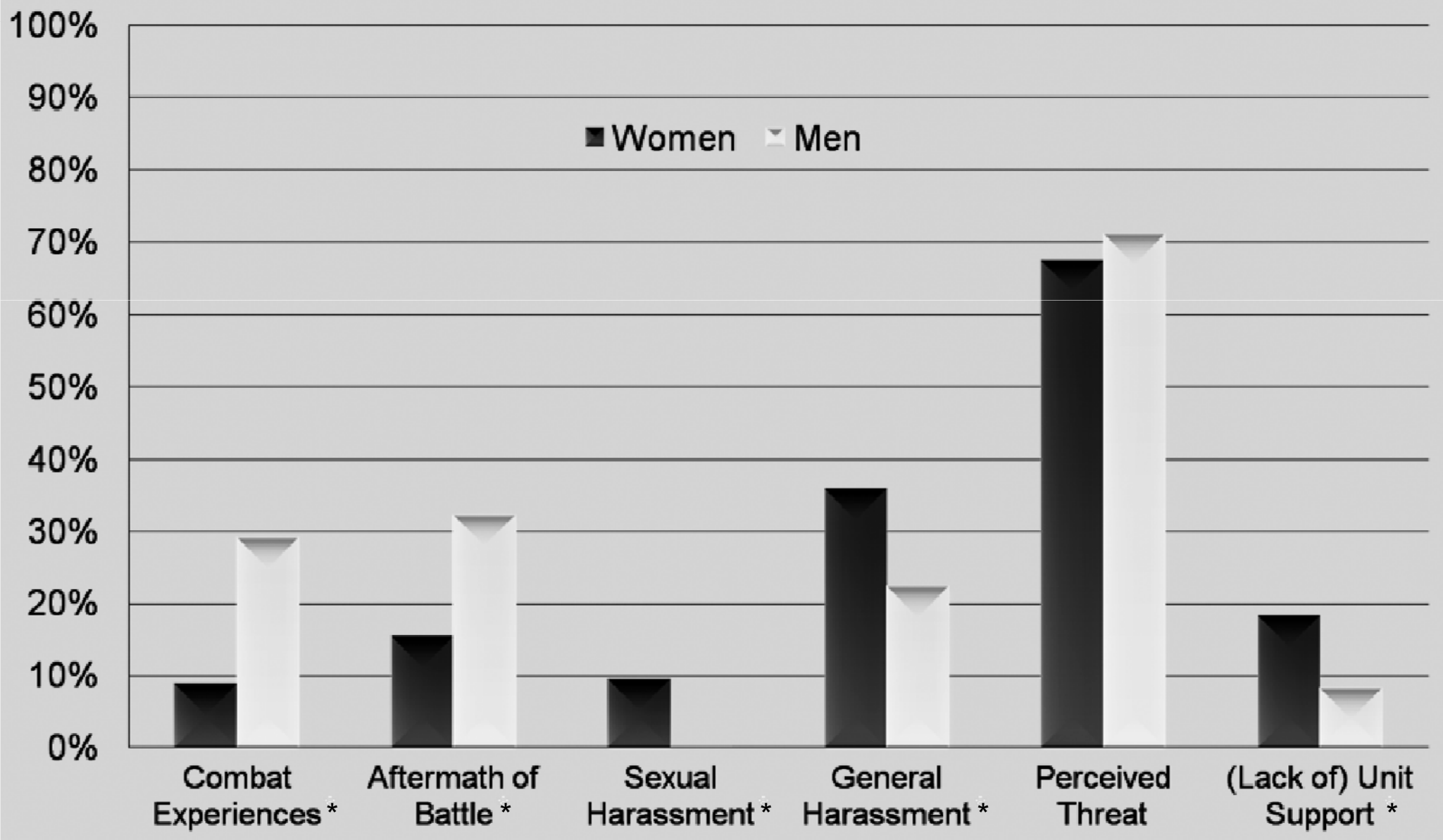
1.4
(1.1,1.7)

1.2
(.90,1.6)

1.4
(1.1,1.6)

*Denotes significant difference between genders

Deployment Stressors: Conservatively Defined



.23
(.18, .30)

.38
(.31, .47)

---b

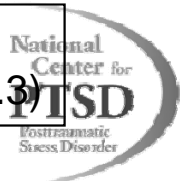
1.9
(1.6, 2.4)

.84
(.70, 1.0)

2.5
(1.9, 3.3)

*Denotes significant difference between genders

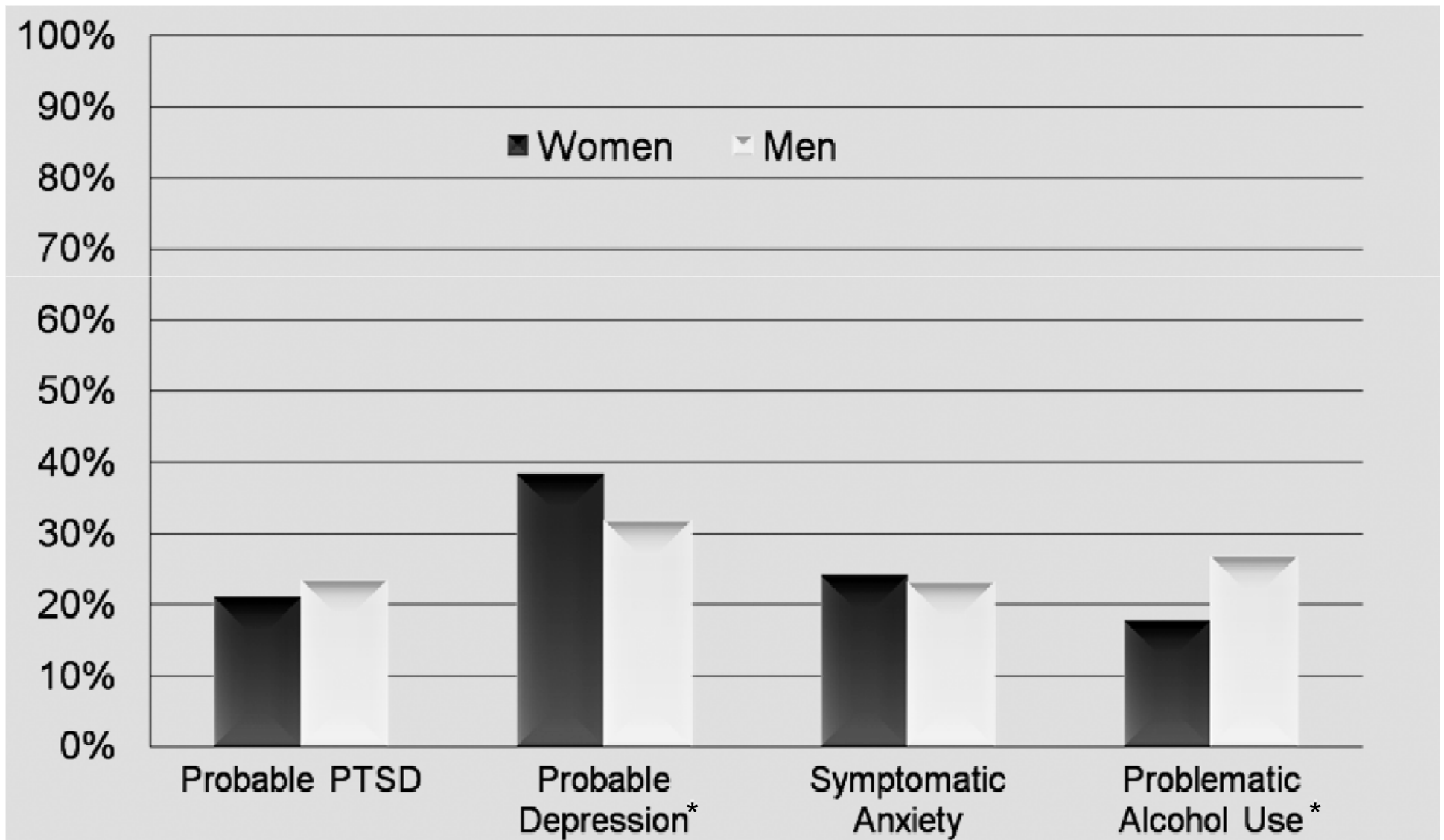
^b Could not be estimated



Question of Interest

2. How do male and female OEF/OIF Veterans differ in their reports of mental health problems following deployment?
 - Are women and men similar or different in the frequency of probable PTSD diagnosis?
 - Are women and men similar or different in the frequency of other mental health conditions, like depression, anxiety and problematic alcohol use?

Gender Differences in Mental Health Conditions



.87
(.70, 1.1)

1.3
(1.1, 1.6)

1.1
(.86, 1.3)

.59
(.47, .72)

*Denotes significant difference between genders

Question of Interest

3. What are the gender specific associations between deployment stressors and PTSD?
 - What is the association between combat stress and PTSD for women? How about for men?
 - What is the association between harassment stress and PTSD for women? How about for men?

Associations between Combat Stress and Probable PTSD, by Gender

| | Women | Men |
|---------------------------------|--|--|
| | Adj. Odds Ratio ^a (95% CI) | Adj. Odds Ratio ^b (95% CI) |
| 1 Point Change in Combat Stress | 1.06 (1.04, 1.07) | 1.06 (1.05, 1.06) |
| 5 Point Change in Combat Stress | 1.31 (1.24, 1.39) | 1.31 (1.26, 1.36) |

^a Model adjusted for combined harassment stress score

^b No confounders identified, aOR identical to OR

Associations between Harassment Stress and Probable PTSD, by Gender

| | Women | Men |
|-------------------------------------|--|--|
| | Adj. Odds Ratio ^a (95% CI) | Adj. Odds Ratio ^b (95% CI) |
| 1 Point Change Harassment Stress | 1.06 (1.04, 1.09) | 1.07 (1.04, 1.10) |
| 5 Point Change in Harassment Stress | 1.36 (1.23, 1.52) | 1.38 (1.19, 1.61) |

^a Model adjusted for total unit support score and combined combat stress score

^b Model adjusted for rank and combined combat stress score

Conclusions

- In terms of deployment stressors-
 - Almost 75% of women were exposed to some level of combat and combat aftermath → most women are experiencing combat in these war zones
 - Men were more likely to report exposure to combat and related stressors → not surprising given that many combat roles are closed to women
 - When stringently defined, more women reported exposure to aftermath of battle experiences than traditional combat → assessment of these experiences should be included to accurately capture women's exposures
 - Women were much more likely to report experiences of sexual harassment → investigations that don't include these items are underestimating the stressor burden for female military personnel

Conclusions

- In terms of gender-specific post-deployment mental health conditions-
 - Female and male Veterans report probable PTSD in roughly equal numbers, just over 20% of both groups
 - Associations between stressors and probable PTSD were also remarkably similar
 - Gender differences in PTSD in the general population weren't replicated in this cohort of OEF/OIF Veterans
 - Perhaps similarities in women's and men's military experiences override pre-existing vulnerabilities
 - Gender-specific risk of PTSD is not absolute, but must be examined within different trauma exposed groups
 - Depression (for women) and alcohol use (for men) may be gender-linked expressions of post-deployment distress

There Are Many Questions Still to Be Answered

- More work examining these same questions in different samples, with different measurement
- Understanding how women's roles within their families (as spouses, daughters, mothers) may be uniquely impacted
- Examining the process of homecoming and reintegration, and whether this differs for men and women
- Understanding women's unique risk/resiliency factors for post-deployment problems and identifying points of intervention
- Evaluating gender differences in the effectiveness of PTSD treatments to guide gender-specific treatment matching

In Closing...

- While our work focuses primarily on stressful events and associated mental health problems, it's important to keep the larger context in mind
- There is no doubt that service in a war-zone comes with challenges
- But these women (and men) serve with pride and they serve because they chose to
- They are strong, capable and resilient
- And we should feel honored to serve them

Thank you for your attention and interest!

For more information contact:

Amy Street, PhD

amy.street@va.gov

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