



Health Effects of Military Service on Women Veterans

EXECUTIVE SUMMARY

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Prepared by:

Evidence-based Synthesis Program (ESP) Center
West Los Angeles VA Medical Center
Los Angeles, CA
Paul G. Shekelle, M.D., Ph.D., Director

Investigators:

Principal Investigator:
Paul G. Shekelle, M.D., Ph.D.

Co-Investigators:

Fatma Batuman, M.D.
Bevanne Bean-Mayberry, M.D., M.H.S.
Caroline Goldzweig, M.D., M.S.P.H.
Christine Huang, M.D.
Donna L. Washington, M.D., M.P.H.
Elizabeth M. Yano, PhD, M.S.P.H.
Laurie C. Zephyrin, M.D., M.P.H., M.B.A.

Research Associate:

Isomi M. Miake-Lye, B.A.



PREFACE

Health Services Research & Development Service's (HSR&D's) Evidence-based Synthesis Program (ESP) was established to provide timely and accurate syntheses of targeted healthcare topics of particular importance to VA managers and policymakers, as they work to improve the health and healthcare of Veterans. The ESP disseminates these reports throughout VA.

HSR&D provides funding for four ESP Centers and each Center has an active VA affiliation. The ESP Centers generate evidence syntheses on important clinical practice topics, and these reports help:

- develop clinical policies informed by evidence,
- guide the implementation of effective services to improve patient outcomes and to support VA clinical practice guidelines and performance measures, and
- set the direction for future research to address gaps in clinical knowledge.

In 2009, an ESP Coordinating Center was created to expand the capacity of HSR&D Central Office and the four ESP sites by developing and maintaining program processes. In addition, the Center established a Steering Committee comprised of HSR&D field-based investigators, VA Patient Care Services, Office of Quality and Performance, and Veterans Integrated Service Networks (VISN) Clinical Management Officers. The Steering Committee provides program oversight and guides strategic planning, coordinates dissemination activities, and develops collaborations with VA leadership to identify new ESP topics of importance to Veterans and the VA healthcare system.

Comments on this evidence report are welcome and can be sent to Nicole Floyd, ESP Coordinating Center Program Manager, at nicole.floyd@va.gov.

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BACKGROUND

In response to a growing need to understand the effects of military service on health status, this report supplements our prior review by focusing directly on the reproductive and trauma effects on women in the military or Veterans who have been deployed. The goal is to broaden the knowledge of VA policy leaders and clinicians about post-deployment health issues for women.

The Key Questions were:

Key Question #1: What research has been published on the effects of deployment on post-deployment reproductive outcomes?

We operationalized “reproductive effects” to encompass the following: fertility issues, birth defects, menstrual effects (e.g., change in cycles, loss of cycles), urinary tract infections, sexually transmitted infections, and reproductive cancers (e.g., cervical, ovarian, etc).

Key Question #2: What research has been published on post-trauma sequelae in OEF/OIF women Veterans, including: mental health problems, suicide, cardiovascular disease, risky health behaviors (including: tobacco use, hazardous alcohol use, substance abuse, suicide, homicide, assaultive behavior, and eating disorders), and other post-trauma sequelae?

METHODS

We searched PubMed in August 2010 using standard search terms. Titles, abstracts, and articles were reviewed in duplicate by team members trained in the critical analysis of literature. Articles were classified according to subject category and narratively summarized in evidence tables.

RESULTS

We screened 2,359 titles, rejected 2,302 based on systematic criteria, and performed a more detailed review of 57 articles that met criteria. From these, we identified 15 articles relating to Key Question #1 (post-deployment reproductive effects) and 29 relating to Key Question #2 (post-trauma sequelae among OEF/OIF women Veterans).

Key Question #1. What research has been published on the effects of deployment on post-deployment reproductive outcomes?

The evidence base for reproductive effects of deployment of women Veterans is modest, mostly consisting of single studies of specific deployments and particular outcomes. Of note, there have been no published assessments of reproductive effects of the current (since 2003) deployments. Data about reproductive effects from past deployments are insufficient to reach strong conclusions. Because many of the outcomes of interest (birth defects, gynecologic cancers) are rare, large sample sizes are needed to assess for possible associations, and often times response rates for large sample studies are below desirable levels. This makes the interpretation of findings questionable.

Key Question #2. What research has been published on post-trauma sequelae in OEF/OIF women Veterans, including: mental health problems, suicide, cardiovascular disease, risky health behaviors (including: tobacco use, hazardous alcohol use, substance abuse, suicide, homicide, assaultive behavior, and eating disorders), and other post-trauma sequelae?

The 13 publications focusing on the post-deployment mental health of our OEF/OIF Veterans found increased risks for new-onset depression, suicide, and firearm suicide; discrepancy between the mental health needs and utilization of mental health services, greater risks for mental disorder hospitalizations, and higher utilization of non-mental health medical services among Veterans with mental health diagnoses; and higher risks for mental diagnoses among certain subgroups.

The post-trauma sequelae highlights three visible issues: 1) early TBI data show a preponderance of men from the military; ongoing evaluation is needed to understand what, if any, gender issues may be important for ongoing care; 2) alcohol use in recently returning women Veterans presents greater risk at lower levels of consumption for women with other risk conditions (PTSD MST, combat trauma); and 3) health care utilization by gender and diagnosis requires ongoing follow-up because while women may initiate contact with VA sooner, utilization did not differ. Moreover, conditions examined so far for deployed or post-deployed women manifest differently (pain syndromes) or differ in cause for evacuation from theatre. Individual studies also examined a number of other possible associations, such as eating disorders, pain, post-deployment distress, etc.; data are too sparse to draw firm conclusions.

CONCLUSIONS

With the continued expansion of women's role in the military, better understanding of the potential health effects of military service on women during and after their military service is essential. While the emerging literature in this area is relatively limited to date, several important themes are nonetheless apparent.

The evidence on the influence of military service on reproductive health is mixed and relies on a modest literature base. Generally, pregnancy outcomes do not appear to differ among deployed vs. undeployed women. However, while several studies demonstrate non-significant differences by deployment status, others present contradictory evidence on the influence of military service on rates of spontaneous abortion, stillbirths, and ectopic pregnancies. Influences on birth outcomes raise more questions than they answer. Only one study reported birthweights, which did not appear to differ by deployment experience of their mothers. More studies have focused on birth defects: about half indicate there are no significant differences in birth defect rates among deployed vs. non-deployed women, whereas the other half report higher rates that are not statistically significant (reflecting problems in statistical power associated with sample sizes for these rare events) or in fact reflect higher rates.

The evidence on post-trauma sequelae among OEF/OIF women (soldiers and Veterans) is also relatively limited, and reflects a chief emphasis on mental health issues. Most of these studies are descriptive, and allude to gender differences in diagnosis, impact and health care utilization. Depression and suicide are major foci, demonstrating the highest rates of incident depression

among women who are deployed and also exposed to combat. Interestingly, deployment without such exposure was associated with lower rates of incident depression than non-deployment. Women Veterans also had higher risks for depression than men, though lower substance use disorders. Suicide risk was reported as being lower among women Veterans, but the standardized mortality ratio among female Veterans is reportedly higher than that of male Veterans. Several of these studies focused on the differences among Veterans vs. non-Veterans more than women vs. men. For example, the suicide rate among all Veterans (male and female) is estimated to be 66 percent higher than that of the general population. Also, among suicide decedents, women Veterans were 1.6 times more likely to use firearms (compared to non-Veterans).

The literature on mental health needs and utilization among OEF/OIF women Veterans was also descriptive and limited. Younger women Veterans were less likely than young male Veterans to use mental health services, which was in contrast to older Veterans (i.e., older women Veterans were more likely to use mental health services than older male Veterans). This pattern held overall and for those with substance abuse or mood/anxiety disorders, whereas no gender differences were found for PTSD care-seeking. Female soldiers had higher risks of hospitalization for mental disorders, and were more likely to be psychiatric evacuees from the field.

The remainder of the literature on other post-trauma sequelae was variable in topic. The evidence of problem-drinking among OEF/OIF women Veterans is mixed (two studies which present contradictory findings). Some of this literature focuses on examining gender differences. For example, predictors of women Veterans' readmission rates for inpatient drug treatment include sexual and physical abuse before, during and after deployment (vs. substance abuse, aggression, and cognitive impairment among men). OEF/OIF women had higher rates of military sexual trauma (MST); and women with MST used VA care more, were less satisfied and had lower perceptions of VA facilities and staff, with particular problems with VA staff among those who had also had combat exposure. OEF/OIF women were less likely to witness the level of killing that men experienced and were less likely to have traumatic brain injuries (TBI), compared to men. Effects of deployment among OEF/OIF women included higher rates of moderate to severe pain, higher distress after the first deployment, and, when added with combat experiences, high rates of eating disorders and extreme weight loss.

FUTURE RESEARCH

In summary, differential effects of military service by gender are apparent, though the volume and quality of the literature is as yet modest. Given that the published scientific literature not uncommonly reflects prior years' research investment in different topic areas, we anticipate that the investment in women's health research by the U.S. Departments of Veterans Affairs and Defense will contribute to a rapidly growing literature base on the health effects of military service on women over the next several years. Such growth may warrant an updated systematic review, comparable to the overarching review that was recently updated,⁴ which demonstrated that more articles were published between 2004 and 2008 than the previous 25 years combined.

More research is needed on the reproductive health effects of military service. Currently, the evidence is mixed with respect to impacts on pregnancy and birth outcomes. One case control

study reported an association between rates of birth defects and deployment status, begging the question about what elements of military service (or pursuit of service) might be contributing factors. The available literature also lacks descriptive evidence of the range of reproductive health issues that women in the military and women Veterans face. Currently, there are studies in progress that may well contribute substantively to this knowledge base, but that are not yet in the published literature.

The VA research portfolio on OEF/OIF Veterans' health and health care will also contribute to the emerging literature on the consequences of military service among OEF/OIF women Veterans. The current literature lays some of the groundwork but does so less comprehensively (spanning topics of mental health, physical health, social function, and so on) than would be optimal. Future research should begin to fill these gaps to produce an increasingly detailed portrait of their post-trauma sequelae.