Ethnic Minority Status and Experiences of Infertility in Female Veterans

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Abstract

Background: In the general population, infertility is increasingly prevalent in ethnic minority women; these women suffer longer and are less likely to access care. There is a paucity of data regarding the issue of race and infertility in the growing female military veteran population.

Materials and Methods: This cross-sectional observational study involved computer-assisted telephone interviews of 1,004 Veterans Administration (VA)-enrolled women aged ≤52 years.

Results: Racial minority veterans were more likely than white veterans to self-report infertility (24% vs. 18%), equally likely to report infertility evaluation (52% vs. 52%), and less likely to report receiving infertility treatment (31% vs. 63%). Differences in self-reported infertility (odds ratios [OR]: 1.50, 95% confidence interval [CI]: 1.02–2.22) and infertility treatment (OR: 0.32, 95% CI: 0.13–0.81) were retained after controlling for age, income, marital status, education, insurance, history of pelvic inflammatory disease, and lifetime sexual assault. While racial minority veterans were equally as likely as white veterans to be evaluated for infertility, white and racial minority groups reported different reasons for not seeking evaluation.

Conclusions: Consistent with civilian studies, our data suggest that racial minority VA-enrolled female veterans are more likely to self-report infertility and less likely to receive infertility treatment. Future research should investigate whether these findings are consistent nationwide and regardless of VA enrollment, and if minority veterans have unique barriers to care. A better understanding of how the VA might improve awareness of infertility evaluation and treatment options, especially for racial minority veterans, is needed.

Keywords: infertility, reproductive health, race and ethnicity, veterans, access to care, sexual assault

Introduction

THE PROPORTION OF U.S. women veterans is expected to continue increasing in the coming decades, as is the proportion of female veterans who identify as a racial minority. Veterans Administration (VA) projections show that 17% of veterans will be female by the year 2045.¹ Within this population of female veterans, currently one-third (34%) identify as

a race other than “white,” and this number is projected to climb to 44% by 2045, representing nearly half of the female veteran population. The number of female veteran users of Veterans Health Administration (VHA) health care has nearly doubled in the past decade, and 39% of these women identify as members of racial or ethnic minority groups.² These evolving population demographics highlight increasing need for comprehensive, equitable reproductive health care services at the VHA.³

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Most of the literature describing the impact of race on infertility and infertility care seeking has thus far come from the general population. While the rates of 12-month infertility in white women have been decreasing overall, the prevalence of infertility reported among African American women has increased over time.⁴ African American and Hispanic women are more likely to experience a longer duration of infertility before seeking evaluation or treatment.⁵⁻⁷ African American and Hispanic women struggle for longer periods of time with infertility on average, and have more problems with geographic access to infertility evaluation and treatment.⁶ Even in states with mandated infertility insurance coverage, African American and Hispanic women are less likely to seek infertility care.⁵ More frequently than white women, African American and Hispanic women cite feeling uncomfortable with their providers, and having difficulty getting an appointment and/or time off of work to attend appointments.⁶ Compared with white women, all ethnic minorities expressed significantly greater concern about the stigma associated with friends and family finding out they had sought infertility treatment.⁶ Existing data correlate ethnic minority status with increased lifetime prevalence of infertility and reduced utilization of evaluation and treatment; in the general population, ethnic minority status is also correlated with poorer access to care, increased likelihood of being uninsured, and greater chance of not obtaining needed medical care due to cost.⁸ Female veterans are uniquely promised access to medical care that, by definition, should be equitable across racial groups within the veteran population. While practical barriers may result in less than fully equitable access for all racial groups within the female veteran population,⁹ studying VHA enrollees provides a unique opportunity to examine other factors that contribute to unequal utilization.

Very few published studies have considered veteran status and exposure to war and sexual assault in relation to infertility.¹⁰⁻¹² Katon et al. compared the incidence of self-reported infertility between male and female veterans serving during Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF), and found that both male and female veterans had comparable rates of lifetime infertility, but that female veterans were more likely to seek medical care for this problem.¹³ In a study by Mattocks et al. examining infertility care received by the female OEF/OIF veterans, it was noted that many women were seeking infertility care outside the VHA, and that the women who had infertility diagnoses were more likely to be young, obese, and African American or Hispanic.¹⁴ While these studies make important contributions to understanding racial disparities in reproductive health care delivery for veterans, there are limited data on prevalence of infertility among women Veterans and whether this differs by race/ethnicity. Further, there is little research on disparities other than those related to contraception. Our study recognizes this gap, and expands the investigation between significance of racial minority status and experiences of reproductive care to include infertility evaluation and treatment.

This study uniquely considers the relationships between racial minority status and self-reported infertility prevalence, infertility evaluation and treatment care received for infertility by female U.S. military veterans. Upon focusing on a study population who are uniformly enrolled in VHA care, we are able to better identify the needs of female veterans currently served by the VHA.

Materials and Methods

Participants

This cross-sectional, observational study was approved by the Institutional Review Boards at the University of Iowa and the Iowa City VA Health Care System. Potential participants were women aged ≤ 52 years who had enrolled in one of two Midwestern VA Medical Centers or outlying clinics during the study period or within 5 years prior; they were identified using electronic VHA records. Participants with health histories that predisposed them to increased risk of gynecologic malignancy (including cervical dysplasia, genital malignancy, and/or natural menopause) were excluded to preserve the primary goal of the study.¹⁵ Participation involved completion of a computer-assisted telephone interview lasting an average of 1 hour and 16 minutes. For further information on recruitment details, see Sadler et al.¹⁵

Measures

Independent variables. Race was self-reported by participants who were able to claim more than one racial or ethnic ancestry, including Native American or Alaskan Native, Asian or Pacific Islander, Hispanic or Latino, Black or African American, and White or Caucasian. Participants were also given the opportunity to self-describe their ancestry if it was not included in the listed responses. Due to a small number of subjects self-identifying in each racial minority group, all participants who identified as a race other than white were combined into a single racial minority category.

Dependent variables. *Prevalence of infertility* was assessed by asking all subjects if they had "ever tried to have a baby but couldn't." *Infertility care*, operationalized as receipt of appropriate evaluation or treatment services from a health care professional, was assessed through separate measures of evaluation and treatment. Subjects were assessed for *infertility evaluation* with the question: "Were you ever evaluated by a health care professional for infertility?" Those who reported having been evaluated were asked if they had ever received *infertility treatment* and to identify the method of treatment received from the following list: artificial insemination, medications to induce ovulation, *in vitro* fertilization, or surgery. Subjects who reported infertility but stated that they had not been evaluated for infertility were asked to identify the most important reason for not seeking infertility evaluation. Thirteen specific response options were provided to the participant, or she could choose "other" and provide her own reason as an open response.

Covariates. Assessed sociodemographic covariates included age, income, marital status, sexual preference, education, insurance status, and VHA use. Subjects reported annual household income numerically; they reported education by identifying the "highest level completed in school." Insurance status was assessed by asking if patients were covered by Medicare, Medigap, Medicaid, TRICARE, CHAMPVA, or private insurance. Utilization of VHA and non-VA health care was assessed with the question: "In the past 5 years, did you receive all, some or none of your medical care at VA Medical Centers?" Subjects were also asked their current sexual preference and if they had ever "had consensual sex with a

female.” Response options for the current sexual preference included heterosexual, lesbian, bisexual, and “don’t know.”

Obstetrical history was gathered, including number and outcome of all pregnancies. Gynecologic measures assessed for any history of diagnosis with pelvic inflammatory disease (PID) or sexually transmitted infection (STI). Patients were asked to report separately if they had ever been diagnosed with gonorrhea, chlamydia, syphilis, genital herpes, venereal warts/HPV, or HIV/AIDS. Data from these fields were then collapsed to generate an overall lifetime prevalence of STI in the study population. Lifetime sexual assault was assessed using the definitions adopted by the American Medical Association¹⁶ and the American College of Obstetricians and Gynecologists,¹⁷ which include any sexual act that occurred without a woman’s consent involving the use or threat of force or against the woman’s wishes, and include attempted or completed sexual penetration of the vagina, mouth, or rectum by penis, fingers, or objects.

Data analysis

Bivariate analysis compared sociodemographic characteristics, obstetric and gynecologic history, and infertility by race. Bivariate analyses were conducted using Student’s *t* tests for age, number of pregnancies, and number of pregnancy terminations. The Mann–Whitney *U* test was used to study income. Chi-square tests of independence were used for race, marital status, highest education level, utilization of VHA versus non-VHA care, sexual orientation, pregnancy termination history, presence of any health insurance, presence of private health insurance, STI and PID history, lifetime sexual assault, history

of pregnancy, self-report of infertility, infertility evaluation, and infertility treatment. Multivariate logistic regression models were then used to examine the relationships between race, self-report of infertility, infertility evaluation, and infertility treatment. Variables were selected for potential model inclusion *a priori* by the research team based on the literature and clinical experience. Backward deletion using Greenland’s mean-squared error (MSE) reduction¹⁸ was used to select the final model, with race as the main exposure, age as a forced variable, and all other variables as candidates for deletion if $\Delta\text{MSE} < 0$.¹⁸ Model fit was assessed with Hosmer–Lemeshow goodness of fit.

Basic descriptive qualitative analysis was used to examine open responses to the item assessing “most important reason for not seeking an infertility evaluation.” Open responses were evaluated and categorized based on recurrent themes that emerged from the data, including medical, social, pregnancy unwanted, lack of awareness, emotional, age, denial, military, faith/fate, access issues, and uncertainty. Individual responses were coded into one or more of these 11 themes for white and racial minority groups.

Results

As described by Sadler et al.,¹⁵ 63% of the 1,670 invited veterans agreed to participate in the study. Ninety-five percent of these participants completed the full interviews, resulting in a total sample size of 1,004 women. Of this sample, 802 identified as white and 202 identified as one of several racial minorities.

Sociodemographic and obstetric/gynecologic data are listed in Table 1 for the total study population, and are also categorized

TABLE 1. SOCIODEMOGRAPHICS AND OBSTETRIC/GYNECOLOGIC HISTORY BY RACE

	Total sample (n = 1,004)	White race (n = 802)	Racial minority ^a (n = 202)	p
Sociodemographics				
Age, mean $\pm$ SD	38.3 $\pm$ 8.8	38 $\pm$ 8.8	39 $\pm$ 8.7	0.072
Income, mean $\pm$ SD	45,053 $\pm$ 48,916	46,304 $\pm$ 52,808	40,090 $\pm$ 28,217	0.109
Highest education level high school, n (%)	153 (15)	125 (16)	28 (14)	0.617
Currently married, n (%)	441 (44)	371 (46)	70 (35)	0.004
Heterosexual, ^b n (%)	935 (93)	755 (94)	180 (90)	0.009
Ever same-sex partnerships, ^c n (%)	119 (12)	83 (10)	36 (18)	0.005
Health insurance, n (%)	840 (84)	682 (85)	158 (78)	0.025
Private health insurance, n (%)	400 (40)	325 (41)	75 (37)	0.423
Use of VA and non-VA health care, n (%)				0.029
Received all of medical care at VAs	323 (32)	243 (30)	80 (40)	
Received some of medical care at VAs	563 (56)	460 (57)	103 (51)	
Received none of medical care at VAs	116 (12)	98 (12)	18 (9)	
Obstetric/gynecologic history, n (%)				
STI (ever diagnosed)	326 (33)	265 (33)	61 (30)	0.440
PID (n = 1,001)	86 (8.6)	60 (8)	26 (13)	0.019
Exposure to sexual assault	620 (62)	495 (62)	125 (62)	0.999
Ever pregnant	768 (77)	606 (76)	162 (80)	0.204
Pregnancy (n = 766)				
Number of pregnancies, mean $\pm$ SD	2.7 $\pm$ 1.7	2.7 $\pm$ 1.6	2.8 $\pm$ 1.8	0.338
Ever terminated a pregnancy, n (%)	205 (27)	160 (27)	45 (28)	0.819
No. of pregnancy terminations, mean $\pm$ SD	0.39 $\pm$ 0.8	0.37 $\pm$ 0.7	0.46 $\pm$ 1.0	0.287

^aThose grouped as racial minority included Black/African American (n = 75), Hispanic/Latina (n = 13), Asian/Pacific Islander (n = 6), Native American/Alaska Native (n = 5), and two or more races (n = 103).

^bSexual preference data missing for 7 participants: 6 white participants and 1 racial minority participant.

^cEver same-sex partnership data missing for 1 racial minority participant.

Bold indicates *p* < .05.

PID, pelvic inflammatory disease; STI, sexually transmitted infection; VA, veterans administration.

TABLE 2. OBSERVED RATES AND ADJUSTED ODDS RATIOS OF SELF-REPORTED INFERTILITY, EVALUATION, AND TREATMENT

	Total sample	White race	Racial minority	Adjusted OR for racial minority (95% CI)
Tried to have a baby but couldn't, <i>n</i> (%)	191/1,004 (19)	143/802 (18)	48/202 (24)	1.50 (1.02–2.22) ^a
Evaluated for infertility, <i>n</i> (%)	100/191 (52)	75/143 (52)	25/48 (52)	0.98 (0.49–1.95) ^b
Treated for infertility, <i>n</i> (%)	65/100 (65)	55/75 (73)	10/25 (40)	0.24 (0.09–0.68) ^c

^aAdjusted OR and 95% CI from regression model adjusting for age, income level, education, marital status, history of PID, insurance coverage, and history of sexual assault.

^bAdjusted OR and 95% CI from regression model adjusting for age, marital status, and history of sexual assault.

^cAdjusted OR and 95% CI from regression model adjusting for age, income, education, marital status, and insurance coverage. CI, confidence interval; OR, odds ratio.

by race. Overall mean age was 38.3 ± 8.8 years and mean income was US\$45,053 $\pm$ US\$48,916. In bivariate analysis, there were no significant differences in age, education level, or private insurance possession between white and racial minority veterans. White and racial minority veterans were similarly likely to have been pregnant before, with no significant difference in numbers of pregnancies, past history of termination, or number of pregnancy terminations. The two groups were also similar in prevalence of reported STI and lifetime sexual assault.

Veterans who identified as racial minorities were less likely to identify as heterosexual (90% vs. 95%, $p=0.009$) than white veterans and significantly less likely to be married at the time of interview (35% vs. 46%, $p=0.004$). They were also significantly less likely to have health insurance (78% vs. 85%, $p=0.025$).

Racial minority veterans were more likely to report having been in the same-sex partnership (18% vs. 10%, $p<0.005$) and significantly more likely to have a history of PID diagnosis than their white colleagues (13% vs. 8%, $p=0.019$). They were also more likely to have received all of their health care at the VHA (40% vs. 30%, $p=0.029$).

Observed prevalence and adjusted odds ratios (ORs) for infertility, evaluation, and treatment are presented in Table 2. Veterans who identified as racial minorities were significantly more likely to self-report infertility as compared with the white veteran participants (OR: 1.50, 95% confidence interval [CI]: 1.02–2.22) after adjusting for age, income, current marital status, history of PID, and lifetime sexual assault. Likelihood

of evaluation for infertility among those reporting infertility was similar between white and racial minority groups (OR: 0.98, 95% CI: 0.49–1.95) after adjusting for age, marital status, and lifetime sexual assault. Despite increased prevalence of self-reported infertility, only 40% of racial minority veterans who were evaluated for infertility reported being treated for infertility compared with 73% of white veterans. This difference remained significant (OR: 0.24, 95% CI: 0.09–0.68) after adjusting for age, insurance status, marital status, education, and household income.

Of the 91 (68 white and 23 minority) female veterans who reported infertility, but did not seek evaluation, 91 provided reasons for not seeking care. Although study participants were offered 13 reasons for not seeking evaluation, only 20% (14 white and 5 minority women) chose one of these reasons, while the majority (51 of 68 white and 18 of 23 minority veterans) chose the “other” option (Fig. 1) and described their own reasoning in an open response.

Identified themes found in veterans’ open responses describing the “other” most important reason for not seeking infertility evaluation are listed in Table 3. The most common theme for both white and ethnic minority groups was medical, with the veterans citing either conditions that had been formally diagnosed by a care provider or medical limitations perceived by the veterans themselves. These veterans tended to believe that these conditions and limitations made the pursuit of evaluation futile. Themes present only within white veteran

FIG. 1. Frequencies of endorsement of response set options for “reason for not seeking infertility evaluation” by race.

TABLE 3. FREQUENCIES OF OPEN RESPONSE REASONS FOR NOT SEEKING INFERTILITY EVALUATION

<i>Themes</i>	<i>Sample response</i>	<i>White race (n = 51) n (%)</i>	<i>Racial minority (n = 18) n (%)</i>
Medical	“pelvis was tilted...that’s what she was told”	9 (18)	4 (22)
Social	“got divorced and didn’t want to try anymore”	7 (14)	2 (11)
Pregnancy unwanted	“decided one child was enough”	3 (6)	4 (22)
Lack of awareness	“didn’t know about it”	1 (2)	3 (17)
Emotional	“didn’t want to hear that she couldn’t have a baby”	2 (4)	1 (5)
Age	“I am 26 years old and I didn’t think that I should have infertility problems”	5 (10)	0
Denial	“just preferred to keep trying”	5 (10)	1 (5)
Military lifestyle limitations	“was deployed”	4 (8)	0
Faith/fate	“felt that this was the way it was supposed to be”	5 (10)	0
Access issues	“no available clinic”	6 (12)	1 (5)
Uncertainty	“may seek this at another time”	8 (16)	2 (11)

responses included spiritual justification that fate or religious faith would ultimately determine the course of fertility; the placement of blame on lifestyle limitations imposed by the military, such as health problems related to stressful work and difficulty conceiving due to being away from one’s partner; and the belief by the veteran that she was either “too old” or “too young” for the treatment that may follow evaluation. Themes more strongly represented among racial minority veterans included a lack of awareness that evaluation and treatment were available, and ambivalence about becoming pregnant.

Discussion

This study offers a novel perspective on the female veteran experience of infertility. While there is an established body of literature recognizing the importance of patient race in infertility prevalence and care, this study describes this relationship within the veteran population. Our investigation revealed that after controlling for age, income, education level, marital status, presence of insurance, personal history of PID, and lifetime sexual assault, minority veterans were more likely to report infertility, but were less likely to report treatment for infertility.

Our open response data show that ethnic minority veterans cited medical conditions, ambivalence about becoming pregnant, and lack of awareness of availability of infertility evaluation and treatment services as reasons for not seeking infertility evaluation. These responses suggest that the VHA has an opportunity to raise awareness on available fertility services for all veterans, especially those in ethnic minority groups. The theme of unwanted pregnancy, which included responses such as “had decided that one child was enough” and “already had two children so decided not to pursue it,” calls into question the perceived definition of infertility among female veterans and demonstrates the challenges of conflicting responsibilities and desires.

Given our knowledge of the increasing proportion of racial minority female veterans, these findings highlight the importance of instituting programs and policies within the VHA system that will address the specific needs of ethnic minority groups. As the number of ethnic minority female veterans continues to increase, the demand for woman’s health care services delivered in a culturally sensitive manner will continue to grow. This is especially true if future studies confirm that minority veterans are more likely to utilize the VHA

system for their health care. Per our previous report from the same data set outlining the significant role of lifetime sexual assault in subsequent fertility, VHA providers need to be aware of the specific circumstances and complex reproductive health risks faced by female veterans and prepared with strategies for addressing such factors among these populations.¹¹

The ongoing discussion regarding expanding options for infertility care in the VHA is a promising start to improving access to infertility treatment, and it will be important to educate providers about specific concerns and disparities among racial minority groups with regard to their unique perceptions of infertility treatment. Our study suggests room for improvement in patient education and communication between providers and patients. A strong therapeutic relationship between provider and patient will help foster an open conversation about a veteran’s struggles to conceive, her childbearing goals, and the challenges she faces in balancing conflicting messages and responsibilities.

Our study focused on women veterans enrolled in VHA, and therefore generalizations to all female veterans cannot be made. However, these findings have important ramifications for the population of VHA-enrolled women. Our means of assessing prevalence of infertility through the question “Have you ever tried to have a baby, but couldn’t?” instead of using the current ACOG guidelines for defining infertility¹⁹ limits the comparability of our findings with other similar studies, which have used more standardized means of defining lifetime prevalence of infertility in a population. Underlying causes of infertility were not assessed, as infertility was not the primary outcome of the larger study. Open responses to the item querying reasons for not seeking infertility evaluation, such as “too fertile,” may suggest varying perceptions of the meaning of the statement “tried to have a baby but couldn’t” and/or a lack of understanding of how infertility is defined. The prevalence of this response highlights the crucial need for clear, accessible definitions and confirmation of participant understanding of these definitions in future surveys and studies.

An additional limitation is that participants were not asked for their reasons for not receiving infertility treatment. While reasons for not seeking evaluation may also apply to reasons for not seeking treatment, future studies may further elucidate racial discrepancies in infertility care seeking by assessing these parameters more specifically, perhaps using a more open-ended and qualitative approach. Our study was also

limited by collapsing the data of all ethnic minority groups into one general population identified as “non-white,” and therefore not allowing us to address the factors specific to veterans of individual ethnic minority groups. True cultural competency and optimal patient care require sensitivity to each patient’s cultural background and individual experience.⁶ Future research should work to identify these considerations specific to individual ethnic minority groups and to adequately design appropriate educational materials for the providers that serve them. Finally, the study is limited geographically. The veterans who participated in the study were enrolled in VHA care at one of two health care centers and their outlying clinics in a rural state and the surrounding areas. Our data therefore reflect the experiences of the female veteran population in a single region of the United States where ethnic minorities are traditionally under-represented.

Conclusions

Consistent with studies of female civilians, our data suggest that racial minority VA-enrolled female veterans are more likely to self-report infertility and less likely to receive infertility treatment. While white female veterans and racial minority veterans were equally likely to seek infertility evaluation, they had thematically different reasons when they chose not to pursue infertility evaluation. Future research should investigate whether this finding is consistent nationwide and regardless of VA enrollment, and if minority veterans have unique barriers to care. Veteran women are a unique population with specific health care needs that must be anticipated by providers. As the VHA works to expand the availability of reproductive health care services to include comprehensive evaluation and treatment of infertility, it is important to recognize the unique needs of the increasing population of veterans who identify as ethnic minorities to provide tailored education and sensitive care to all veteran patients.

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Author Disclosure Statement

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References

1. Statistics NCFVAa. Projected Veteran Population 2013–2043. Veteran Population, 2014. Available at: www.va.gov/vetdata/docs/quickfacts/Population_slideshow.pdf Accessed April 12, 2015.
2. Frayne SM, Phibbs CS, Saechao F, et al. Sourcebook: Women Veterans in the Veterans Health Administration. Volume 3. Sociodemographics, Utilization, Costs of Care, and Health Profile. Washington DC: Women’s Health Evaluation Initiative, Women’s Health Services, Veterans Health Administration, Department of Veterans Affairs, 2014:17.
3. Office of the Actuary USVA. Living veterans by age group, gender, race/ethnicity, gender 2015–2045. VetPop2014: The Veteran Population Model, 2014. Available at: www.va.gov/VETDATA/Veteran_Population.asp Accessed December 20, 2017.
4. Stephen EH, Chandra A. Declining estimates of infertility in the United States: 1982–2002. *Fertil Steril* 2006;86:516–523.
5. Jain T. Socioeconomic and racial disparities among infertility patients seeking care. *Fertil Steril* 2006;85:876–881.
6. Missmer SA, Seifer DB, Jain T. Cultural factors contributing to health care disparities among patients with infertility in Midwestern United States. *Fertil Steril* 2011;95:1943–1949.
7. Kessler LM, Craig BM, Plosker SM, et al. Infertility evaluation and treatment among women in the United States. *Fertil Steril* 2013;100:1025–1032.
8. Martinez ME, Ward BW, Adams PF. Health care access and utilization among adults aged 18–64, by race and hispanic origin: United States, 2013 and 2014. NCHS Data Brief No 208, 2015. Available at: www.cdc.gov/nchs/data/databriefs/db208.htm Accessed May 3, 2018.
9. Borrero S, Zhao X, Mor MK, Schwarz EB, Good CB, Gellad WF. Adherence to hormonal contraception among women veterans: Differences by race/ethnicity and contraceptive supply. *Am J Obstet Gynecol* 2013;209:103.e1–11.
10. Abu-Musa AA, Kobeissi L, Hannoun AB, et al. Effect of war on fertility: A review of the literature. *Reprod Biomed Online* 2008;17 Suppl 1:43–53.
11. Verret C, Jutand MA, De Vigan C, et al. Reproductive health and pregnancy outcomes among French gulf war veterans. *BMC Public Health* 2008;8:141.
12. Ryan GL, Mengeling MA, Booth BM, et al. Voluntary and involuntary childlessness in female veterans: Associations with sexual assault. *Fertil Steril* 2014;102:539–547.
13. Katon J, Cypel Y, Raza M, et al. Self-reported infertility among male and female veterans serving during Operation Enduring Freedom/Operation Iraqi Freedom. *J Womens Health* 2014;23:175–183.
14. Mattocks K, Kroll-Desrosiers A, Zephyrin L, et al. Infertility care among OEF/OIF/OND women Veterans in the Department of Veterans Affairs. *Med Care* 2015;53(3 Suppl 1):S68–S75.
15. Sadler A, Mengeling M, Syrop C, et al. Lifetime sexual assault and cervical cytologic abnormalities among military women. *J Womens Health* 2011;20:1693–1701.
16. American Medical Association. Strategies for treatment and prevention of sexual assault. Chicago, IL: AMA, 1995.
17. American College of Obstetricians and Gynecologists. Sexual assault. Committee Opinion No. 592. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2014;123:905–9.
18. Greenland S, Daniel R, Pearce N. Outcome modelling strategies in epidemiology: Traditional methods and basic alternatives. *Int J Epidemiol* 2016;45:565–575.
19. Medicine PCotASfR. Definitions of infertility and recurrent pregnancy loss. *Fertil Steril* 2008;90:S60.

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