Original research article

Factors associated with long-acting reversible contraception use among women Veterans in the ECUUN study☆

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ABSTRACT

Objectives: The objective of this study is to understand patient-, provider- and system-level factors associated with long-acting reversible contraception (LARC) use among women Veterans and with receipt of LARC methods within the Veterans Affairs (VA) system.

Study design: We analyzed data from a national telephone-based survey of 2302 women ages 18–44 receiving primary care in VA. Multivariable regression was used to examine adjusted associations of participant-reported patient-, provider- and facility-level factors with LARC use and within-VA receipt of LARC among women Veterans.

Results: Among 987 women Veterans at risk of unintended pregnancy, 294 (30%) reported using LARC, 65% of whom had received their method within VA. Higher LARC use was observed among women who were multiparous vs. nulliparous [adjusted odds ratio (aOR)=1.52; 95% confidence interval (CI)=1.04–2.22] and did not desire future pregnancies (aOR=1.88; 95% CI=1.31–2.68). Although overall LARC uptake was not associated with any provider- or facility-level factors, receipt of these methods within VA was associated with receiving both general and gender-specific health care by a single provider (aOR=2.81; 95% CI=1.20–6.61) and with receiving care within a women's health clinic (aOR=2.54; 95% CI=1.17–5.50).

Conclusions: While patient-level factors were more strongly correlated with use of LARC, provider- and system-level factors influence whether women received these methods within VA.

Implications: This study of patient-, provider- and system-level correlates of LARC use in VA, the country's largest integrated healthcare system, highlights that women Veterans share similar patient-level factors associated with LARC use as the general population and that continuity with providers and comprehensive women's health services can facilitate LARC access.

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1. Introduction

The women Veteran population is growing and has recently reached over two million[1,2]. Women of childbearing age (18–45 years) are the fastest growing group of new users of Veterans Affairs (VA) health care

[3]. VA has focused on key initiatives to meet the needs of this expanding population to ensure receipt of high-quality sexual and reproductive health services. These initiatives include the following: training primary care physicians in gynecologic care (identified as designated women's health providers), ensuring women have access to these trained providers with the goal of 85% of women receiving care by a women's health provider, establishing women's health clinics where women receive comprehensive general and women's health care by these providers, and hiring or contracting with gynecologists to provide specialized gynecologic services. The VA has made concerted efforts to provide primary care and gender-specific services, such as contraceptive care and cervical cancer screening, by the same provider and ideally in a single visit [4].

Contraception care, one of the most commonly used services by reproductive-aged women, is provided by VA as part of comprehensive primary care, and women can typically access the full range of

contraceptive methods with no or minimal out-of-pocket expense. Veterans may receive contraceptive prescriptions from VA pharmacies for a co-pay of $9, with no co-pays for disabled Veterans or those who were recently discharged from service in Afghanistan or Iraq. Long-acting reversible contraceptive (LARC) methods, the intrauterine device (IUD) and subdermal implant, are provided at no cost [5,6]. For placement (and removal) of LARC methods, women can be referred as needed to a gynecologist on-site or at another VA site, or via contract care at a non-VA community site. Veterans may also seek contraceptive care outside the VA system altogether using other (non-VA) insurance or paying out of pocket.

LARC use is higher among women VA users at risk of unintended pregnancy compared to comparable, age-adjusted estimates in the general population (23% vs.11%) [7]. Over 90% of all VA facilities offer prescription and management of hormonal contraception, and receipt of care within a VA women's health clinic is associated with significantly higher odds of using contraception [8]. Yet, onsite IUD placement is less consistent. Sites with a women's health clinic or gynecologist [9],

hospital-based versus community-based practices and availability of a clinician providing women's health training to other clinicians[10,11] are more likely to offer on-site IUD insertion.

In non-VA settings, access to and utilization of LARC are influenced by patient factors such as age, marital status and contraceptive knowledge [12–14]; provider factors including knowledge and skills [15–17]; and system-level factors such as Title X funding (a federal funding program for family planning and related preventive health services) [10,18,19]. No prior research has evaluated factors associated with LARC utilization within the VA healthcare system; only factors associated with on-site IUD availability have been investigated. Given the unique demographic and clinical characteristics of women VA users, including a high prevalence of racial/ethnic minority status, medical and mental illness, and low socioeconomic status [20,21], understanding correlates of LARC use may provide insight about contraceptive decision making in other vulnerable populations. Furthermore, it is unknown which provider-level factors, system-level factors or policy efforts within VA are associated with LARC use. Our objective was, first, to

Table 1
Patient-, provider- and facility-level characteristics, by overall LARC use (*N*=987)

Characteristics *N*=987	No LARC use *n*=693 (70.2)	LARC use *n*=294 (29.8)	p value
Patient demographics			
Age, mean (SD)	32.9 (5.4)	32.8 (5.2)	.64
Age			.58
20–29	197 (28.4)	82 (27.9)	
30–34	235 (33.9)	103 (35.0)	
35–39	160 (23.1)	75 (25.5)	
40–44	101 (14.6)	34 (11.6)	
Race/ethnicity			.13
Non-Hispanic white	345 (49.8)	163 (55.4)	
Non-Hispanic black	198 (28.6)	76 (25.9)	
Hispanic	102 (14.7)	30 (10.2)	
Other	48 (6.9)	25 (8.5)	
Marital status			**.0003**
Married/living with partner	301 (43.5)	169 (57.5)	
Single	190 (27.5)	58 (19.7)	
Divorced/separated/widowed	201 (29.0)	67 (22.8)	
Education: college degree or above	364 (52.5)	153 (52.0)	.89
Income			**.008**
<$20,000	174 (25.5)	48 (16.4)	
$20,000–<$40,000	215 (31.5)	108 (37.0)	
≫$40,000	294 (43.0)	136 (46.6)	
Additional non-VA insurance	324 (46.8)	158 (53.7)	**.04**
Patient reproductive and medical factors			
Parity ≥1	396 (57.1)	211 (71.8)	<**.0001**
History of unintended pregnancy	361 (52.1)	184 (62.6)	**.002**
History of abortion	144 (20.8)	54 (18.4)	.39
Pregnancy intention			<**.0001**
Trying for pregnancy in next year or later	309 (44.6)	100 (34.0)	
Does not plan for pregnancy in the future	251 (36.2)	153 (52.0)	
Unsure of pregnancy intention	133 (19.2)	41 (13.9)	
Tobacco use	134 (19.3)	54 (18.4)	.72
≥1 Medical condition	339 (48.9)	163 (55.4)	.06
≥1 Mental health condition	441 (63.6)	198 (67.3)	.26
History of military sexual trauma	362 (52.2)	151 (51.4)	.80
Provider and facility characteristics			
Sees provider for all medical care	548 (79.7)	230 (79.6)	.98
Primary care provider performs pap smears	412 (60.6)	162 (55.9)	.17
Female provider	541 (79.1)	231 (79.7)	.84
Presence of women's health clinic and patient receipt of primary care within that clinic			.71
No women's health clinic or does not know	224 (32.3)	89 (30.3)	
Site has women's health clinic but patient does not receive primary care in this clinic	139 (20.1)	65 (22.1)	
Patient receives primary care in women's health clinic	330 (47.6)	140 (47.6)	
Site has gynecologist	429 (61.9)	190 (64.6)	.42
Type of primary care clinic			.49
Community-based clinic	323 (46.6)	130 (44.2)	
Hospital-based clinic	370 (53.4)	164 (55.8)	
Geographic census regions			.19
Northeast	56 (8.1)	27 (9.2)	
Midwest	124 (17.9)	51 (17.3)	
South	375 (54.1)	141 (48.0)	
West	138 (19.9)	75 (25.5)	

assess patient-, provider- and system-level predictors of LARC use in women Veterans and, second, to assess the association of these predictors with LARC receipt within VA.

2. Methods

2.1. Study design

We analyzed cross-sectional data from the Examining Contraceptive Use and Unmet Need (ECUUN) study, a survey designed to determine rates of contraceptive use, unmet need for prescription contraception and unintended pregnancy in a national sample of reproductive-aged women Veterans who receive health care from the VA. Although ECUUN was not specifically designed or powered to assess correlates of LARC use, the relatively high prevalence of LARC among women Veterans allowed us the opportunity to explore patient-, provider- and system-level factors associated with these contraceptive methods.

This national telephone survey was conducted with a random sample of women Veterans aged 18–44 years across all US regions that had used VA for primary care in the previous 12 months. Potential participants were mailed study packets that included an invitation letter, a study brochure and a postage-paid reply card with an opt-out option. All women who did not opt out were subsequently called to determine interest in participating, undergo eligibility screening and provide verbal informed consent. Interviews were conducted between April 2014 and January 2016 by trained interviewers using computer-assisted telephone interview technology. Of the 2769 enrolled, 2302 women

completed the survey (83% completion rate). Participants received a $30 honorarium for their participation. Additional details about study design and recruitment have been previously published [7].

Respondents were similar to nonrespondents from the sampling frame with respect to age, race/ethnicity, marital status, income, presence of medical and mental illness, and geographic region, suggesting that the ECUUN sample is representative of the larger population of reproductive-aged female VA users [7]. Both VA Pittsburgh and University of Pittsburgh Institutional Review Boards approved the study.

2.2. Study sample

The study cohort included women Veteran survey participants who were at risk for unintended pregnancy ($n=987$), defined as women who were sexually active with men within the last year; who had no reported history of hysterectomy, sterilization or infertility; and who were not currently pregnant, recently postpartum, or seeking pregnancy. Thus, the study sample included women who reported prescription contraception use, barrier or behavioral methods or no contraceptive method at time of last intercourse during the last 12 months.

Using VA administrative data linked to the survey data, we assessed utilization of any VA services in the year prior to patient-reported LARC placement date in an effort to include only those women who had their LARC placed while enrolled in the VA healthcare system. This led to an exclusion of 69 women without any evidence of VA care within 1 year prior to the date of LARC placement. We also excluded 4 women who

Table 2
Factors associated with overall LARC use, unadjusted and adjusted models (N=987)

Characteristics N=987	LARC use (%)	Unadjusted OR (95%) CI	Adjusted model[a] OR (95%) CI	p value
Patient demographics				
Age				
20–29	29.4	1.0	1.0	
30–34	30.5	1.05 (0.74–1.49)	0.76 (0.52–1.11)	.16
35–39	31.9	1.13 (0.77–1.64)	0.65 (0.41–1.01)	.053
40–44	25.2	0.81 (0.51–1.29)	0.39 (0.23–0.68)***	<.001
Race/ethnicity				
Non-Hispanic white	32.1	1.0	1.0	
Non-Hispanic black	27.7	0.81 (0.59–1.12)	0.76 (0.54–1.08)	.13
Hispanic	22.7	0.62 (0.40–0.97)*	0.58 (0.36–0.93)*	.02
Other	34.2	1.10 (0.66–1.85)	1.11 (0.64–1.93)	.71
Marital status				
Married/living with partner	36.0	1.0	1.0	
Single	23.4	0.54 (0.38–0.77)***	0.79 (0.52–1.18)	.25
Divorced/separated/widowed	25.0	0.59 (0.42–0.83)**	0.64 (0.44–0.92)*	.02
Income				
<$20,000	21.6	1.0	1.0	
$20,000–<$40,000	33.4	1.82 (1.23–2.70)**	1.62 (1.07–2.46)*	.02
≫$40,000	31.6	1.68 (1.15–2.45)**	1.36 (0.87–2.11)	.18
Additional non-VA insurance				.41
No	26.9	1.0	1.0	
Yes	32.8	1.32 (1.01–1.74)*	1.14 (0.84–1.54)	
Patient reproductive and medical factors				
Parity ≥1				
No	21.8	1.0	1.0	
Yes	34.8	1.91 (1.42–2.56)***	1.52 (1.04–2.22)*	.03
History of unintended pregnancy				
No	24.9	1.0	1.0	
Yes	33.8	1.54 (1.16–2.03)**	1.4 (1–1.96)	.051
Pregnancy intention				
Trying for pregnancy in next year or later	24.4	1.0	1.0	
Does not plan for pregnancy in the future	37.9	1.88 (1.39–2.55)***	1.88 (1.31–2.68)***	<.001
Unsure of pregnancy intention	23.6	0.95 (0.63–1.44)	0.97 (0.62–1.5)	.88
≥1 Medical condition				
No	27.0	1.0	1.0	
Yes	32.5	1.30 (0.99–1.71)	1.2 (0.9–1.61)	.21

*p<.05, **p<.01, ***p<.001. The p values for unadjusted models were listed in Table1.
 a Covariates associated with LARC use at p<.15 from the bivariate analyses were included in the multivariable models. This included race/ethnicity, marital status, income, parity, history of unintended pregnancy, pregnancy intention, ≥1 medical condition and additional non-VA insurance. Age was forced into the final model.

did not report the location of LARC placement, resulting in a final sample of 221 women for the secondary analysis of LARC receipt within VA.

2.3. Study variables

Our primary outcome was self-reported use of LARC, either an IUD or implant, at time of last vaginal intercourse. Participants reported all contraceptive methods used at last intercourse, and we categorized responses by level of contraceptive effectiveness: highly effective methods (LARC), moderately effective methods (pill, patch, ring, Depo-Provera), least effective methods (condom, diaphragm, cervical cap, sponge, spermicide, withdrawal and fertility awareness methods) or no method. Women reporting use of more than one method were classified according to their most effective method. Given the small sample size of women using the implant ($n=40$), we combined both LARC methods, IUD ($n=254$) and implant, for analysis.

Our secondary outcome was LARC receipt within VA. Participants who reported current use of LARC were asked where they received their method. We categorized women as having received LARC within VA if they reported receiving their method at the VA site where they typically receive their primary care or at another VA site.

Predictors of interest included patient-, provider- and facility-level factors, as assessed via participant survey data, that may be associated with contraceptive choice. Patient-level factors included demographic and clinical characteristics (parity, history of unintended pregnancy, history of abortion, pregnancy intention, tobacco use, history of military trauma, and presence of specific medical and mental health diagnoses). Medical diagnoses included health conditions that could influence contraceptive recommendations, including hypertension, thromboembolic disease, coronary artery disease, breast cancer, stroke, liver disease, diabetes, HIV/AIDs, migraines, lupus and seizure disorders. Mental health diagnoses included major depression, bipolar disorder, posttraumatic stress disorder, schizophrenia or anxiety.

The survey assessed provider-level factors by asking women to describe characteristics of their VA healthcare provider. Variables included whether a woman's provider performs her pap smears, which was used as an indicator for whether the provider is a women's health provider. In addition, women were asked whether they receive most or all of their care with that provider to assess the extent to which they receive comprehensive care (general primary care and gender-specific health care) by one provider in one location. However, we did not ask women which specific provider or type of provider placed their LARC method, if they were using one. Facility-level factors included VA clinic type attended (hospital or community based), geographic region (Northeast, Midwest, South, West), presence of a women's health clinic and receipt of their care within this clinic, and presence of an on-site gynecologist. VA clinic type and geographic region were ascertained using VA administrative data linked to the survey data through scrambled social security numbers, while the other facility-level variables were based on survey response.

2.4. Statistical analysis

Our primary analysis examined patient-, provider- and facility-level predictors of overall LARC use. We conducted descriptive analyses using Student's t tests for continuous variables and χ^2 tests for categorical variables. Bivariate and multivariable logistic regression models estimated the unadjusted and adjusted associations between these factors and the outcome of LARC use. Multivariable models included the patient-, provider- and facility-level factors from the ECUUN dataset indicating an association with LARC use at the $p \ll .15$ level in bivariate analyses. Unadjusted odds ratios, adjusted odds ratios (aORs) and 95% confidence intervals (CIs) were reported. We assessed all provider-level and system-level variables for co-linearity and found no evidence of co-linearity between variables.

Among LARC users, we conducted a secondary analysis to determine whether these same patient-, provider- and facility-level factors were associated with receipt of LARC within VA. Descriptive analyses, and bivariate and adjusted models described above were constructed with the outcome of within-VA LARC receipt.

We also conducted sensitivity analyses to examine the impact of combining IUD and implant users on our findings. We first compared characteristics of women using IUDs and implants and then reran the aforementioned analyses excluding implant users to examine factors associated with IUD use and factors associated with receipt of an IUD within VA. All analyses were conducted using SAS, version 9.4 (SAS Institute, Cary, NC, USA).

Table 3
Patient-, provider- and facility-level characteristics, by within-VA LARC receipt

Characteristics $N=221$	Outside-VA LARC $n=77$ (34.8)	Within-VA LARC $n=144$ (65.2)	p value
Patient demographics			
Age, mean (SD)	32.9 (4.6)	33.7 (5.2)	.17
Age			.53
20–29	18 (23.4)	30 (20.8)	
30–34	31 (40.3)	53 (36.8)	
35–39	22 (28.6)	40 (27.8)	
40–44	6 (7.8)	21 (14.6)	
Race/ethnicity			.51
Non-Hispanic white	49 (63.6)	77 (53.5)	
Non-Hispanic black	15 (19.5)	39 (27.1)	
Hispanic	7 (9.1)	16 (11.1)	
Other	6 (7.8)	12 (8.3)	
Marital status			**.04**
Married/living with partner	50 (64.9)	76 (52.8)	
Single	16 (20.8)	25 (17.4)	
Divorced/separated/widowed	11 (14.3)	43 (29.9)	
Education: college degree or above	44 (57.1)	77 (53.5)	.60
Income			.154
<$20,000	7 (9.2)	25 (17.4)	
$20,000–<$40,000	26 (34.2)	54 (37.5)	
≫$40,000	43 (56.6)	65 (45.1)	
Additional non-VA insurance	50 (64.9)	67 (46.5)	**.009**
Patient reproductive factors			
Parity ≥1	58 (75.3)	101 (70.1)	.41
History of unintended pregnancy	47 (61.0)	92 (63.9)	.68
History of abortion	14 (18.2)	32 (22.2)	.48
Pregnancy intention			.99
Trying for pregnancy in next year or later	24 (31.2)	45 (31.3)	
Does not plan for pregnancy in the future	40 (51.9)	75 (52.1)	
Unsure of pregnancy intention	13 (16.9)	24 (16.7)	
Patient medical factors			
Tobacco use	15 (19.5)	23 (16.0)	.51
≥1 Medical condition	38 (49.4)	84 (58.3)	.20
≥1 Mental health condition	49 (63.6)	103 (71.5)	.23
History of military sexual trauma	40 (51.9)	77 (53.5)	.83
Provider and facility characteristics			
Sees provider for all medical care	52 (67.5)	127 (90.1)	<**.0001**
Primary care provider performs pap smears	39 (50.6)	92 (64.3)	**.049**
Female provider	58 (75.3)	117 (81.8)	.25
Presence of women's health clinic and patient receipt of primary care within that clinic			<**.0001**
No women's health clinic or does not know	34 (44.2)	34 (23.6)	
Site has women's health clinic but patient does not receive primary care in this clinic	20 (26.0)	23 (16.0)	
Patient receives primary care in women's health clinic	23 (29.9)	87 (60.4)	
Site has gynecologist	41 (53.2)	102 (70.8)	**.01**
Type of primary care clinic			.22
Community-based clinic	42 (54.5)	66 (45.8)	
Hospital-based clinic	35 (45.5)	78 (54.2)	
Geographic census regions			.59
Northeast	5 (6.5)	16 (11.1)	
Midwest	15 (19.5)	21 (14.6)	
South	36 (46.8)	69 (47.9)	
West	21 (27.3)	38 (26.4)	

3. Results

Of the 987 women at risk for unintended pregnancy, the mean age was 33 years, and the majority of respondents were non-Hispanic white (51.5%), married or living with a partner (47.7%) and multiparous (61.5%) (Table 1). Just over half (55.2%) of women had a history of unintended pregnancy, and 40.9% of women did not desire future pregnancy. Over half (52.0%) of women reported experiencing military sexual trauma, 51% reported one or more medical conditions, and 65% reported one or more mental health conditions.

In this sample, 294 (30%) women used a LARC method at last sex, with 40 (4.1%) reporting implant use and 254 (25.7%) reporting IUD use. There were 330 (33.4%) women using other prescription contraceptive methods: 213 (21.6%) used the pill, 57 (5.8%) used the vaginal ring, 54 (5.5%) used Depo-Provera, and 6 (0.6%) used the Ortho-Evra patch. Of the 288 (30%) using nonprescription methods, women reported male condom use (15%), withdrawal (6.1%) and periodic abstinence (5.1%). A total of 7.6% of women reported no method use at last sex.

In bivariate analysis, marital status, income, multiparity, history of unintended pregnancy, intention for future pregnancy and additional non-VA insurance were all significantly associated with LARC use (Table 1). History of medical comorbidities, mental illness and military sexual trauma were not significantly associated. In the multivariable model (Table 2), women were more likely to use LARC if they had an income between $20,000 and $40,000 versus less than $20,000 (aOR= 1.62; 95% CI=1.07–2.46), were multiparous versus nulliparous (aOR= 1.52; 95% CI=1.04–2.22) and had no intention for future pregnancy versus intention for pregnancy in next year (aOR=1.88; 95% CI= 1.31–2.68). Women were less likely to use LARC if they were age 40–44 versus age 20–29 (aOR=0.39, 95% CI=0.23–0.68), Hispanic versus non-Hispanic white (aOR=0.58; 95% CI=0.36–0.93) and divorced/widowed/separated versus married/living with partner (aOR=0.64;

95% CI=0.44–0.92). There were no provider- or facility-level factors significantly associated with LARC use in either unadjusted or adjusted analyses.

The subsample used in the secondary analysis of factors associated with within-VA LARC receipt (n=221) had similar demographic profile to the overall sample. However, more women in the subsample were multiparous (71.9%), had a history of unintended pregnancy (62.9%) and had no intention for future pregnancy (52.0%) compared to the overall sample. Among LARC users, 144 (65.2%) women received their method within VA, with 108 (48.9%) receiving their LARC on-site where their primary care provider was located and 36 (16.3%) receiving their LARC at another VA site. The remaining 77 (34.8%) women received their method outside of VA. VA providers referred 12 (5.4%) women outside VA, and 37 (16.7%) women reported receiving their LARC in a military-associated clinic or hospital. The remaining 28 (12.6%) women received their LARC at nonmilitary clinics.

In bivariate analysis of the within-VA LARC subsample, marital status, having only VA insurance, receiving all general and women's health care by their VA primary care providers, VA primary care providers performing pap smears, receiving primary care within a women's health clinic and on-site gynecology were associated with receipt of LARC within VA (Table 3). In the multivariable model, the factors associated with within-VA LARC receipt included age 40–44 versus 20–29 years (aOR=3.45; 95%CI=1.01–11.86), divorced/separated/widowed versus married/living with a partner (aOR=2.62; 95%CI=1.11–6.17), receiving all general and women's health care by their VA primary care providers (aOR=2.81; 95%CI=1.20–6.61) and receiving primary care within a women's health clinic (aOR=2.54; 95%CI=1.17–5.50). (See Table 4.)

In the sensitivity analysis, we found that IUD users and implant users differed across several patient- and provider-level factors. IUD users were more likely to have no intention for future pregnancy compared to implant users (53% vs. 45%, p=.04). Several additional differences

Table 4
Factors associated with within-VA LARC receipt, unadjusted and adjusted models

Characteristics N=221	Within-VA LARC n (%)	Unadjusted OR (95% CI)	Adjusted[a] OR (95% CI)	p value
Patient demographics				
Age				
20–29	30 (62.5)	1.0	1.0	
30–34	53 (63.1)	1.03 (0.49–2.14)	1.33 (0.58–3.02)	.50
35–39	40 (64.5)	1.09 (0.50–2.39)	1.45 (0.59–3.59)	.42
40–44	21 (77.8)	2.10 (0.71–6.18)	3.48 (1.01–11.86)*	**.049**
Marital status				
Married/living with partner	76 (60.3)	1.0	1.0	
Single	25 (61.0)	1.03 (0.50–2.12)	1.09 (0.47–2.51)	.85
Divorced/separated/widowed	43 (79.6)	2.57 (1.21–5.46)*	2.62 (1.11–6.17)*	**.03**
Reproductive and medical factors				
Has additional non-VA insurance				
No	77 (74.0)	1.0	1.0	
Yes	67 (57.3)	0.47 (0.27–0.83)**	0.67 (0.34–1.34)	.26
VA provider and facility characteristics				
Sees provider for all medical care				
No	17 (35.9)	1.0	1.0	
Yes	127 (70.9)	3.59 (1.79–7.20)***	2.81 (1.20–6.61)*	**.02**
Primary care provider performs pap smears				
No	52 (57.3)	1.0	1.0	
Yes	92 (70.2)	1.72 (0.98–3.02)	1.06 (0.54–2.10)	.86
Presence of women's health clinic and patient receipt of primary care within that clinic				
No women's health clinic or does not know	34 (50.0)	1.0	1.0	
Site has women's health clinic but patient does not receive primary care within this clinic	23 (53.5)	1.15 (0.54–2.47)	0.90 (0.37–2.22)	.82
Patient receives primary care in women's health clinic	87 (79.1)	3.78 (1.95–7.33)***	2.54 (1.17–5.50)*	**.02**
Site has gynecologist				
No/do not know	42 (53.8)	1.0	1.0	
Yes	102 (71.3)	2.13 (1.20–3.79)**	1.89 (0.92–3.89)	.08

*p<.05, **p<.01, ***p<.001. The p values for unadjusted models were listed in Table 3.
 a Covariates associated with LARC use at p<.15 from the bivariate analyses were included in the multivariable models. This included marital status, additional non-VA insurance, sees provider for all medical care, primary care physician performs pap smears, presence of a women's health clinic and patient receipt of primary care within that women's health clinic, and site has gynecologist. Age was forced into the final model.

did not reach statistical significance, perhaps due to the small sample size. IUD users were less likely to have mental health issues compared to implant users (65% vs. 80%, p=.07), less likely to have a history of military sexual trauma (49% vs. 65%, p=.09) and more likely to see their primary care provider for all care (82% vs 68%, p=.06). In the multivariable analysis excluding implant users, however, the multivariable model results for the factors associated with IUD use and the factors associated with receipt of an IUD within VA were similar to the main analysis (data not shown).

4. Discussion

In this study of women Veterans at risk of unintended pregnancy, we found that 30% of women were using LARC and that younger age, higher income level, having additional non-VA insurance, non-Hispanic ethnicity, multiparity, marital status and completion of childbearing were associated with LARC use. We found no provider- or facility-level factors significantly associated with LARC use. In our secondary analysis, we found that seeing a provider for all medical care and receiving care within a women's health clinic were associated with receiving LARC within VA.

Prior research has shown that clinic-based interventions that improve provider knowledge and counseling around LARC along with LARC insertion skills increase patient use of LARC and decrease unintended pregnancy [22]. In our study, overall LARC use was not associated with provider-level or facility-level factors. This may suggest that requisite training of VA primary care providers as women's health providers, if practicing within a women's health clinics, along with a high target of women Veterans being seen by these women's health providers allows providers, regardless of their location and characteristics, to provide comprehensive care for women. Our findings are similar to non-VA populations in which decisions to use LARC appear to be shaped by patient factors including individual circumstances, attitudes and reproductive goals [23,24]. Data in non-VA populations have also found that LARC use is also facilitated by a system that prioritizes access to LARC, as is seen in postabortion and same-day LARC placement settings that optimize access to IUDs and implants [22,25,26]. None of our measured facility-level factors were associated with overall LARC utilization, perhaps suggesting relatively equal access to LARC across VA regardless of clinic setting, clinic type or presence of gynecologists.

Previous studies have shown an association between having an on-site gynecologist [9,10] and availability of on-site LARC provision. The association between these variables did not reach significance in our study, and reasons for this discrepancy are unclear. One possible explanation is that our study is underpowered to detect significant differences between IUD use and certain system-level factors. In addition, prior studies analyze the outcome of on-site IUD availability, whereas we report patient-reported receipt of LARC within VA. Lastly, care structure within the VA may have changed since data were published in prior studies: in our study, comprehensive care by a primary care provider within a women's health clinic was associated with higher within-VA LARC receipt. Our data may thus reflect a broader spectrum of women's health care provided by primary care physicians, as hoped for through the implementation of VA's key initiatives.

Our study has a number of strengths including a large, diverse sample of women receiving contraceptive care in the largest, national, integrated health system in the United States. Our study also examines the clinically significant outcome of women's LARC use rather than LARC availability, which may not necessarily correlate with LARC use. Our study was also able to assess the association of medical comorbidities, mental illness and sexual trauma history with LARC use, which to our knowledge has not previously been examined, though these factors were not ultimately found to be associated with LARC use.

There are some important limitations to consider in this analysis. Given that this study utilizes self-reported data from patients, information on the provider and some of the facility-level factors may be

incorrectly representing the presence or absence of these services. We were limited to analysis of the patient-, provider- and facility-level variables that were captured in this study, thus raising the possibility of residual confounding by unmeasured variables. It is also not known how individual clinic-level policies or provider-level counseling approaches may have influenced women's contraceptive decision making, as these factors were not assessed in this survey. Although VA insurance covers most or all costs of contraceptive methods, there are some variations based on when women served in the military (for example, women who served in Iraq or Afghanistan have 5 years of full coverage) and service-connected disability, and some women may have paid for contraception out of pocket or through non-VA insurance. We did not collect data on payment and type of insurance used for contraceptives, and thus, we do not know how costs may have affected contraceptive use [5]. Our survey data do not capture motivations for women to seek LARC placement outside the VA or information about whether LARC was prescribed for contraceptive or noncontraceptive benefits. Importantly, we may not have seen statistical significance in some facility and provider factors given our small sample size and the fact that our study was not powered for the outcomes in our secondary analysis. Finally, limitations are inherent to the cross-sectional survey design, and any associations cannot imply causality.

Our research suggests that patient-level factors appear to drive LARC use, while provider- and facility-level factors may be less influential in LARC uptake, provided that LARC is accessible. In the VA population, where women have universal access to healthcare, free or low-cost contraception, and providers trained and proficient in women's health care, LARC use is high, indicating that when women have access to effective contraceptive methods, they will often use these methods.

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