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Implementation Science: scaling a training intervention to include IUDs and implants in contraceptive services in primary care

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Abstract

Building capacity for contraceptive services in primary care settings, including for intrauterine devices (IUDs) and implants, can help to broaden contraceptive access across the US. Following a randomized trial in family planning clinics, we brought a provider training intervention to other clinical settings including primary care in all regions. This implementation science study evaluates a national scale-up of a contraceptive training intervention to varied practice settings from 2013–2019 among 3,216 clinic staff serving an estimated 1.6 million annual contraceptive patients. We measured providers' knowledge and clinical practice changes regarding IUDs and implants using survey data. We estimated the overall intervention effect, and its relative effectiveness in primary care settings, with generalized estimating equations for clustered data. Patient-centered counseling improved, along with comfort with method provision and removal. Provider knowledge increased ($p<0.001$), as did evidence-based counseling for IUDs (aOR 3.3 95% CI 2.8–3.9) and implants (aOR 3.5, 95% CI 3.0–4.1), and clinician competency in levonorgestrel IUDs (aOR 2.5 95% CI 2.1 3.1) and implants (aOR 2.4 95% CI 2.0–2.9). While proficiency was lower initially in primary care, gains were significant and at times greater than in Planned Parenthood health clinics. This

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intervention was effectively scaled, including in primary care settings with limited prior experience with these methods. Recent changes to Title X family planning funding rules exclude several large family planning providers, shifting greater responsibility to primary care and other settings. Scaling effective contraceptive interventions is one way to ensure capacity to offer patients full contraceptive services.

Keywords

Implementation science; Contraceptive access; Primary care; Intrauterine devices; Subdermal implant; Provider training intervention

Introduction

Contraceptive access has been increasingly restricted in the US, [1–3] including recent changes to Title X family planning funding rules, which exclude several large family planning providers, shifting greater responsibility to primary care.[4,5] Primary care providers are on the front lines of care, with wide geographic reach,[6] and yet many are not trained to offer all contraceptives, especially intrauterine devices (IUDs) and subdermal implants. While methods such as oral contraceptive pills are offered by over 90% of family physicians, national surveys have shown that fewer than half of family physicians provide IUDs and 11% provide the implant; among nurse practitioners in primary care, 12% provide IUDs and 10% implants.[7–9] Primary care providers often face challenges integrating IUDs and implants into contraceptive care,[10-12]with more diverse demands on staff and less core training in contraception than among reproductive health specialists.[8,13]

Several new devices have become available in the past decade, including low-dose hormonal IUDs and an improved subdermal implant. The Affordable Care Act's mandate to cover all FDA-approved methods has helped patients choose from a wider range of contraceptives, including these devices.[14–16] Access, however, can be limited by provider familiarity and skills.[8,17,18] Enhanced skills among primary care providers can increase readiness for their growing role in contraceptive services across the country. Readiness also includes familiarity with principles of patient-centered care, especially for IUDs and implants, where a trained clinician is needed for initiation, and there are concerns about reluctance to remove devices, provider bias and patient-centered care.[19–22] Contraceptives vary in benefits and side effects, and method use is highly sensitive to patient preferences.[23–25] Patient-centered care allows patients to select a method, without training limitations or bias of their provider.[20,26]

Prior to this research, we tested in a randomized trial an all-staff contraceptive training intervention in 40 specialized reproductive health clinics across US regions.[27] The intervention increased patients' access to IUDs and implants, while continuing to support patient counseling on more familiar methods such as oral contraceptives.[27] The training focused on respecting patient preferences, and results showed that the intervention upheld patient autonomy and shared decision-making.[19,27,28] In the randomized trial, participants visiting trained providers at family planning sites were more likely to learn about a wider range of contraceptives, and less likely to experience undesired pregnancies than those visiting control sites.[27] In spite of public health concerns that greater youth access to IUDs

and implants would lead to increased sexually transmitted infections (STIs),[29] the intervention neither compromised condom use nor led to higher STI rates.[30]

Notably, the benefits of interventions tested in randomized trials are not often realized, with historically inadequate emphasis in the health fields on dissemination and implementation science.[31,32] Even in a supportive policy environment, medical advances are often slow to disseminate to practice.[33,34] In this study, we investigated whether the intervention could be successfully adapted and scaled to other practice settings throughout the U.S. where underserved patients seek care, but often cannot access IUDs or the implant.[18] Our research question was whether the intervention would continue to have an impact in the scale-up phase, and specifically whether it was successful in different practice settings, including primary care.

Materials and Methods

We conducted this implementation science evaluation from 2013–2019, scaling the intervention to varied clinical practice settings across the United States.[1] The scale-up was guided by the conceptual framework of Diffusion of Innovation,[33] highlighting the need for active dissemination of clinical practice change, to providers with 'readiness for change' from 'early' to 'mid-adopters', so innovations do not stall.[35] We hypothesized that a training intervention could catalyze clinical practice changes.[36] The randomized trial showed our intervention to be effective among 'early adopters' in Planned Parenthood health centers.[13] During this implementation science phase, using selection strategies guided by Diffusion of Innovations, we brought our intervention to other Planned Parenthood health centers as well as family planning clinics that had not participated in the trial, and then to 'mid-adopters' including primary care practices and other settings. In 2018–19, we enhanced the curriculum on addressing provider bias in contraceptive care.

This implementation science study included data from 123 trainings, with health staff from 1,297 clinics serving over 1.6 million annual contraceptive patients. We offered training primarily to non-profit or publicly-funded clinics serving reproductive-aged patients; these clinics desired provider capacity building, but had limited resources and access to in-service training opportunities. The study population comprised clinicians and clinic staff providing direct patient care who participated in the training, including non-licensed staff.

Intervention

The intervention is a Continuing Medical Education (CME)-accredited course of the University of California, San Francisco School of Medicine, with onsite training to increase patient autonomy and access to the full range of contraceptives, including IUDs and implants, using an evidence-based curriculum. The training uses a team approach with all clinic staff to achieve clinical practice change, enhancing the skills of members of the healthcare team to allow task-sharing,[37] and streamlining clinic requirements to reduce

[1]States and territories include: Arizona, California, Connecticut, Florida, Georgia, Illinois, Indiana, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Montana, New Hampshire, New Mexico, New York, North Carolina, Northern Mariana Islands, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, Washington, Washington DC, Wisconsin.

multiple patient visits.[13] A clinic assessment pre-training helps to gauge the best teaching level. The day-long course begins with a full-staff session on contraceptive ethics, such as the importance of patient-centered counseling inclusive of all methods, patient preferences, and method removal upon request. The session covers medical eligibility and updated evidence for IUDs and implants, and billing, stocking, clinic flow and systems issues. This session is followed by a specialized counseling practicum to build skills, with a focus on implicit bias and health equity, informed by the tenets of reproductive justice. A clinician practicum provides hands-on IUD placement and removal practice with uterine models and problem-based learning on complex cases. Clinicians can receive supplemental hands-on training for implants with the manufacturer. Participants are given clinic resources, such as protocols, competency checklists, simplified screening forms, and coding guides, as well as follow-up technical assistance for ongoing needs. In primary care settings, trainings help to build referral networks through bringing together several clinics in a geographic area and working to identify IUD proctoring opportunities with an interested local expert.

Data collection included quality and impact measures. We collected training quality data from formal CME evaluations. To assess impact of the intervention on clinical practice change, we collected baseline and 3-month follow-up surveys from clinic staff participating in the training. Participants completed baseline surveys online or on paper prior to training, and follow-up surveys online 3 months afterwards to give time to enact changes. The survey included items on practice setting, professional training, knowledge, skills and clinical practices for contraceptive care. Survey items were developed and validated in prior research.[8,38] Newly developed items on provider bias, patient preference, and barriers to device removal were included in 2019 (n=170). Survey participants were entered into a random annual drawing with $100 Amazon e-gift cards. The study was approved by the University of California, San Francisco Institutional Review Board.

Measures

We measured changes in IUD and implant knowledge and counseling skills among all clinic staff, and provision specifically among clinicians.

Knowledge.—We measured knowledge of medical eligibility for IUD and implant use, with two scales adapted from prior research[38] regarding the Centers for Disease Control's (CDC) Medical Eligibility Criteria (MEC) for Contraceptive Use.[39] The first 6-item scale measured provider knowledge of patient eligibility for IUD use if: adolescent, nulliparous, immediately post-abortion, HIV positive, or history of STI or pelvic inflammatory disease (PID) in last 2 years (all eligible for IUD per MEC).[39] The scale was developed by summing up correct items over total items, with values ranging from 0 to 1, reflecting the proportion of correct responses. The scale's internal consistency reliability was 0.82. The second scale, developed in the same way, included 12-items regarding knowledge of patient eligibility for IUD or implant with common medical conditions. Specifically, questions asked clinic staff if they would consider a copper IUD, levonorgestrel (LNG) IUD, or etonogestrel implant for patients with obesity, diabetes, history of hypertension, or smoking. Again, based on the CDC MEC, each method can be used for patients with these conditions.[39] The scale's internal consistency reliability was 0.96.

Skills in counseling and provision practices.—We measured counseling skills based on whether clinic staff felt they were sufficiently experienced to counsel on IUDs and implants (0 strongly disagree/disagree vs. 1 agree/strongly agree), and whether they routinely counseled contraceptive patients on the copper IUD as emergency contraception (EC) (0 never/sometimes vs. 1 usually/always). We measured clinician competency in provision with items asking whether providers felt comfortable placing the copper IUD, LNG IUDs, and the implant (0 strongly disagree/disagree vs. 1 agree/strongly agree). We recorded if method provision at their clinic requires only one visit (yes/no), [13,40] and, finally, whether they provided IUDs and implants in the last month (yes/no).

Our main independent variable was the intervention effect, or the change over time (pre-intervention vs. post-intervention), which was estimated for each study outcome. Our practice variable included the diverse settings trained: primary care (with Federally Qualified Health Centers and department of health community clinics), Planned Parenthood, other family planning clinics (largely health department Title X clinics and non-profits), out-patient hospital clinics, and other practices such as school-based health centers. We included interaction terms in the models for time and practice setting to investigate whether the intervention had a differential impact on clinical care outcomes by practice setting. We included two interaction terms, one with primary care and one for all other practice settings, with Planned Parenthood as the reference category as the intervention's effectiveness was demonstrated in that setting.[38]

As covariates, we considered professional training (physician, advance practice clinician, registered nurse/health educator/social worker/medical assistant), training year to adjust for any differences over time, and geographic region (Northeast, South, Midwest, West).

Quality Measures: To assess the intervention quality in different practice settings, we included measures from the CME course evaluation of overall training quality, faculty quality, and educational content, on a Likert scale 1–5 (poor, fair, good, very good, excellent). We also asked whether issues of cultural and linguistic competency in diverse populations were adequately addressed (no, yes), as well as intention to change practice. Since 2019, we included measures for patient-centered care, including focus on patient preferences, awareness of provider bias, and barriers to device removal. We collected descriptive data from the sub-sample of clinics able to provide data on their patient populations (age, race/ethnicity, health insurance).

Analyses

The analysis population included all clinic staff participating in patient care who attended the training intervention. We presented descriptive statistics for quality measures. To examine training impact on clinical practice outcomes, we used a repeated cross-sections approach, including data from all providers completing a baseline or follow-up survey. This approach is the most appropriate for the study design, allowing us to account for differences in clinical practice pre- and post-training, and any staff turnover.[41,42] We tested for significant differences in characteristics of responders to non-responders.

To examine the intervention impact on study outcomes, including provider knowledge, counseling skills and provision, we used generalized estimating equations to account for the clustering of providers within each training session, with robust standard errors.[43,44] The training sessions had groups of providers from several sites, so we clustered at the higher level (training) to accommodate any repeated measures clustered within a staff member. We used logistic regression for binary outcomes and linear regression for continuous outcomes. To ascertain whether the training impact was similar when scaled to primary care as compared to Planned Parenthood, we assessed the significance of the interactions of training impact (time) with the practice settings. We adjusted for provider type, training year and region in the models. Analyses were conducted with Stata version 16 (Stata Corp, College Station, TX), and significant differences reported at $p<0.05$.

Results

A total of 3,557 clinic staff with direct patient care participated in the training, and 3,216 (90%) completed the baseline survey. Forty-four percent of the sample were clinicians (15% physicians and 29% advance practice clinicians) (Table 1). Of the physicians, 36% were family physicians, 22% pediatricians, 20% obstetrician-gynecologists, 6% internists or 16% other physicians. Other staff largely comprised RNs (17%), medical assistants (9%) and health educators (6%). The clinic staff sample was 54% White, 17% Black, 11% Hispanic, 9% Asian/Pacific Islander and 9% other/multi-racial. Clinic staff practiced in a range of settings, with 32% in primary care, 19% Planned Parenthood, 17% other family planning clinics, 7% hospitals, and 24% in other settings. Clinic data on patients showed a diverse clientele, with 33% White, 32% Black, 22% Hispanic, and 13% Asian/other, and 46% on public insurance/Medicaid and 28% uninsured.

Of staff who attended the training, 2,126 completed follow-up surveys (60%). There was no difference between responders and non-responders at follow-up by key characteristics measured, including provider type, age, and practice setting. Descriptive quality measures showed high training quality including faculty and educational content, with an average rating of 4.6 out of 5. A total of 96% reported that issues of cultural and linguistic competency in diverse populations were adequately addressed in the course and 96% reported an intention to change practice.

Descriptive results of patient-centered measures from our most recent trainings showed that the proportion of providers reporting they always ask patients what is important to them in a contraceptive method increased by 37% (from 51% to 70%) post-training, and asking about patient concerns by 18% (from 63% to 74%). Reports that IUD and implant removals require only one clinic visit increased by 12% and 19%, respectively. Reports of barriers to device removal upon request decreased by follow-up: the proportion of providers reporting insurance coverage as a barrier decreased by 32%; those reporting clinic scheduling was a barrier declined by 17%, and those seeing devices as too costly for removal declined by 26%.

Intervention Scale-up: Knowledge, Skills and Clinical Practice Change

Knowledge about IUDs and implants.—Knowledge about patient eligibility for IUDs and implants increased significantly (Table 2). Familiarity with patient eligibility for IUDs increased from 0.68 (scale range 0–1) at baseline to 0.84 at follow-up (adjusted coefficient [adj coef] 0.17; 95% confidence interval [CI], 0.15–0.19) (Table 2). Knowledge of patient eligibility by medical conditions also significantly increased (adj coef 0.13; 95% CI, 0.11–0.15), with the largest knowledge increases for hormonal IUDs and implants, across different medical conditions including obesity, diabetes, history of hypertension and smoking.

Changes in contraceptive counseling skills and provision.—Post-training, counseling on IUDs (86%) and implants (83%) reached similar levels as counseling on oral contraceptives, which remained equally high at baseline and follow-up (85%). Providers with enough experience to counsel on IUDs (aOR 3.31; 95% CI 2.82–3.88) and implants (aOR 3.48; 95% CI 2.97–4.04) increased significantly (Table 2), as did the counseling on the copper IUD as emergency contraception (aOR 1.93; 95% CI 1.67–2.23).

Providers reported their clinics were more likely to require only one visit for IUDs (aOR 1.55; 95% CI 1.36–1.78) and implants (aOR 1.55; 95% CI 1.33–1.72) (Table 2). Clinician competency significantly increased for provision of all methods, including LNG IUDs (Liletta® aOR 2.59 95% CI 2.09–3.21, Skyla® aOR 2.55 95% CI 2.80–3.12, Mirena® aOR 1.82 95% CI 1.52–2.18), copper IUD (aOR 1.80; 95% CI 1.50–2.16), and implant (aOR 2.43 95% CI 2.01–2.95). Clinicians were significantly more likely to report having provided IUDs (aOR 1.52; 95% CI 1.30–1.76) and implants (aOR 1.71; 95% CI 1.44–2.05) in the last month.

Intervention effect in the primary care setting

We examined whether the training impact in primary care settings was comparable to that in Planned Parenthood. Results confirmed that pre-training, Planned Parenthood clinicians had higher proficiency than in primary care; however, changes in primary care were substantial. Frequencies showed significant increases in clinicians comfortable placing IUDs and implant in primary care ($p \leq 0.001$) (Figure 1). Provision also increased among primary care clinicians, from 22.5% to 35% for IUDs and 31.5% to 49% for implants ($p \leq 0.001$). Analyses with interaction terms for intervention impact with practice setting revealed that overall the intervention had a similar and strongly significant impact in primary care as in Planned Parenthood across the outcomes. Indeed, training participants in primary care actually achieved greater improvements in knowledge outcomes and counseling experience, as shown by the significant interaction term of intervention with primary care in these models (all $p<0.05$) (Table 3a). In addition, changes in primary care were similar to changes in Planned Parenthood in requiring only one visit for methods (Table 3b); improved clinician competency in placing copper IUDs, LNG IUDs and implants (Table 4a); and in providing these methods in the last month (Table 4b).

Discussion and conclusions

Despite the challenges in scaling up healthcare innovations, we showed that it was possible to do so with an intervention to increase contraceptive access. The intervention impact was comparable, and sometimes greater, in primary care as compared to specialty contraceptive clinics. National survey data have documented that few primary care providers offer contraceptive devices, although some practices at the forefront have shown that it is possible to do so.[7] Our training intervention was associated with changing clinical care across the U.S. Although the initial skill level was less advanced, gains were significant and in some cases even greater in primary care, overcoming challenges to offering the full range of contraceptives.[12] Clinical practice changes were similar to those demonstrated in the randomized trial of Planned Parenthood clinics with gold-standard evidence,[45] with sustained change over time as measured one year post-training.[38,46]

To help spur innovation, there is growing emphasis on scaling effective interventions and pragmatic measures.[47] Using measures of clinical practice change, we saw that health centers participating in the trainings increased the breadth of their contraceptive services. Counseling skills improved for the IUD and implant, while counseling on the more familiar oral contraceptive pill remained high. Results showed significantly greater provider knowledge and evidence-based patient eligibility for IUDs and implants, including for adolescents, an important patient population not always considered for these methods.[18,48,49]

Our results also point out that the level of proficiency among providers in specialized reproductive health clinics was in general higher both pre- and post-training, as demonstrated in prior research.[13] However, it is possible to advance contraceptive services available in primary care. Stocking of devices and addressing cost concerns are important components of provision, along with training. A recent study in three Midwestern Federally Qualified Health Centers demonstrated that cost support for contraceptive devices helps patients to access these methods in community clinics.[50,51] Our study presenting implementation science data across more than a thousand clinics builds on this evidence by showing how a relatively low-cost intervention, such as a training course, can increase method provision in primary care settings even in the absence of ear-marked funds for devices.

This study has limitations. The aim was to scale our training intervention that had been proven effective, so the design no longer had a randomized controlled comparison group. Data collection focused on practice changes reflecting the ‘real life’ clinic context, outside the structure of a trial, and relied on survey instruments, subject to social desirability bias, not direct observation. While we proved our intervention’s impact on patient outcomes in the trial, we can only surmise that we might have a similar impact on patient outcomes in this implementation science stage.[27,30] Our trained sites included under-resourced clinics across the country, rather than a set sampling frame. Our follow-up was relatively short, although there may be less of a chance that changes were due to other factors. However, unmeasured clinic factors may affect method provision. Outside of a randomized trial, we cannot definitively rule out the role of other factors, but these results were remarkably

consistent with those of our randomized controlled trial.[27] Our evaluation metrics matched those in the prior randomized study to be able to compare results; however, a drawback is that they reflect key measures in the field from several years back. Newly developed measures with a broader set of questions on device removal or provider bias were collected in 2019.

These data indicated effective program diffusion in a nationwide scale-up, including among primary care providers, who will be increasingly important contraceptive providers as Title X funding is restricted from reaching many reproductive health specialist providers. The intervention relies on known theoretical frameworks of medical practice change, with an impact on clinical practice change over time.[38] Adaptation to specific settings, and involvement of the health care team were important factors in its effectiveness. CME evaluations demonstrated that clinicians and clinic staff were enthusiastic about learning new evidence and skills. Patients benefit from a wide selection of contraceptive methods as they experience method-related side effects, change preferences over time, and often change the method itself.[52] Contraceptive training and services in the United States, however, are of varying quality and many patients still lack access to essential services and a full range of methods. Training programs can help to advance contraceptive care and to build provider capacity to offer patients a variety of contraceptive methods in diverse clinic settings including primary care.

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Highlights

- We scaled a training intervention nationally for full contraceptive services.
- 3,213 clinic staff serving an estimated 1.6 million patients were trained.
- IUDs and implants were added to contraceptive care in diverse clinic settings.
- The intervention effectively strengthened contraceptive services in primary care.

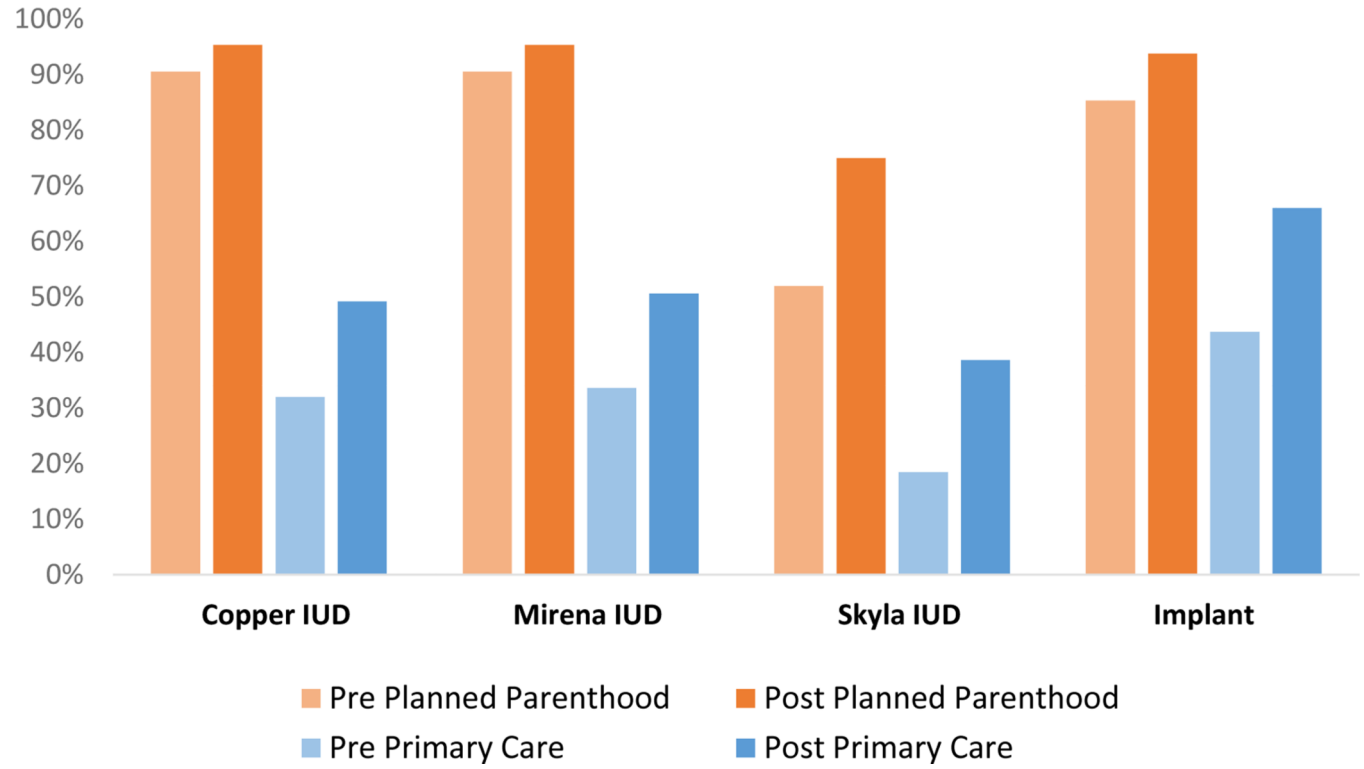

Fig. 1.
Percentage of clinicians comfortable placing IUDs and the subdermal implant: Planned Parenthood vs Primary Care.

Table 1.

Clinic staff participating in IUD and implant training, at baseline and follow-up[a]

	Baseline (n=3,216)		Follow-up (n=2,126)	
Sex, n (%)				
Female	2,948	(92)	1,956	(92)
Male	246	(8)	152	(7)
Other/Non-binary[b]	9	(0)	11	(1)
Age (mean ± SD)	41.23 +−12.11		41.76 +−12.34	
Race/ethnicity, n (%)				
White	1,715	(54)	1,118	(55)
Black	558	(17)	362	(18)
Hispanic	350	(11)	192	(9)
Asian/Pacific Islander	291	(9)	196	(10)
Other	277	(9)	181	(9)
Provider type, n (%)				
Physician	486	(15)	303	(14)
Advanced Practice Clinician	922	(29)	583	(27)
Registered Nurse	549	(17)	354	(17)
Medical Assistant	296	(9)	197	(9)
Health Educator	197	(6)	142	(7)
Manager/Director	257	(8)	201	(9)
Other	509	(16)	346	(16)
Education, n (%)				
High school, GED, technical or vocational	337	(11)	198	(10)
Two-year college degree	381	(12)	229	(11)
Four-year college degree	731	(23)	488	(24)
Graduate or professional	1,743	(55)	1,132	(55)
Practice setting, n (%)				
Planned Parenthood clinic	610	(19)	449	(21)
Primary care	1,019	(32)	697	(33)
Family planning clinic (other)[c]	555	(17)	355	(17)
Hospital	224	(7)	134	(6)
Other [d]	807	(25)	491	(23)
Region, n (%)				
Northeast	794	(25)	519	(24)
South	975	(30)	665	(31)
Midwest	474	(15)	332	(16)
West	973	(30)	610	(29)

[a]Follow-up data in tables and figure are from 3-month survey

[b]This category was added to survey responses in 2018.

[c] These non-Planned Parenthood family planning clinics were primarily health department clinics and non-profit organizations.

[d] Other practice settings include teen clinics, school-based clinics, and college health centers.

Table 2.

Changes in provider knowledge, competency and clinical practices for IUDs and implants post intervention: Results from multivariable GEE regression models

Outcome variables	Baseline (%) n=3,216	Follow-up (%) n=2,126	Coef	95% CI	N
Knowledge scales[¥] (range 0–1)					
IUD eligibility	(68)	(84)	0.17	[0.15 – 0.19]	4,879
IUD/implant eligibility with medical conditions	(70)	(83)	0.13	[0.11 – 0.15]	4,691
Provider skills, counseling and provision practices			**aOR**		
Integrating LARC into counseling contraceptive patients					
Counseling skills for IUDs	(70)	(88)	3.31	[2.82 – 3.88]	5,015
Counseling skills for implant	(68)	(87)	3.48	[2.97 – 4.07]	5,018
Counsels patients routinely on copper IUD as EC	(18)	(30)	1.93	[1.67 – 2.23]	4,740
Same-visit service delivery of contraception					
IUD requires only 1 clinic visit	(26)	(35)	1.55	[1.36 – 1.78]	4,728
Implant requires only 1 clinic visit	(31)	(41)	1.51	[1.33 – 1.72]	4,693
Comfort in placing methods (clinician only)	n=1,436	n=865			
Copper IUD	(46)	(60)	1.80	[1.50 – 2.16]	2,294
Mirena IUD	(48)	(61)	1.82	[1.52 – 2.18]	2,291
Skyla IUD	(28)	(48)	2.55	[2.08 – 3.12]	2,264
Liletta IUD[*]	(22)	(41)	2.59	[2.09 – 3.21]	1,506
Nexplanon Implant	(54)	(73)	2.43	[2.01 – 2.95]	2,262
Clinician provision practices (clinicians only)					
Provided IUDs in the last month	(38)	(48)	1.52	[1.30 – 1.76]	2,301
Provided implants in the last month	(43)	(55)	1.71	[1.44 – 2.05]	2,301

[¥]The first scale has 6-items asking providers if they would consider the following patients eligible for an IUD: nulliparous, teenager, immediately post-abortion, HIV positive, or history of STI or PID in the last 2 years.

The second scale comprises 12-items asking providers about patient eligibility for the copper IUD, the levonorgestrel IUD and the etonogestrel implant for patients with common medical conditions, including obesity, diabetes, history of hypertension, or smoker

[*]Training on Liletta was offered starting in 2016. aOR= Adjusted odds ratio, CI = confidence interval. Models adjusted for provider type, practice setting, training year, and region.

Table 3a.

Association of training intervention with changes in knowledge and counseling skills in primary care settings compared to other settings

	IUD eligibility		IUD/implant eligibility with medical conditions		Has enough experience to counsel on IUD		Has enough experience to counsel on the implant	
Main Effects	**Coef**	**95% CI**	**Coef**	**95% CI**	**Adj OR**	**95% CI**	**Adj OR**	**95% CI**
Training intervention	0.14	[0.08 – 0.21]	0.11	[0.08 – 0.14]	2.06	[1.27 – 3.35]	2.05	[1.46 – 2.89]
Practice setting								
Planned Parenthood (Ref)	-	-	-	-	-	-	-	-
Primary care	−0.15	[−0.23 – – 0.07]	−0.09	[−0.17 – – 0.02]	0.26	[0.17 – 0.40]	0.24	[0.15 – 0.38]
Family planning clinic	−0.03	[−0.11 – 0.05]	0.04	[−0.04 – 0.13]	0.40	[0.26 – 0.64]	0.42	[0.26 – 0.67]
Hospital	−0.11	[−0.20 – – 0.02]	−0.09	[−0.17 – – 0.01]	0.35	[0.22 – 0.62]	0.24	[0.14 – 0.43]
Other	−0.03	[−0.11 – 0.05]	−0.02	[−0.09 – 0.06]	0.32	[0.21 – 0.49]	0.32	[0.21 – 0.50]
Interaction Terms								
Planned Parenthood *(Ref)*	-	-	-	-	-	-	-	-
*(Intervention *Prim a ry care)*	0.08	[0.00 – 0.15]	0.06	[0.01 – 0.10]	1.74	[1.01 – 3.01]	1.92	[1.24 – 2.97]
*(Intervention *Other practices[a])*	−0.003	[−0.08 – 0.07]	−0.004	[−0.04 –0.04]	1.70	[1.00 – 2.87]	1.79	[1.21 – 2.66]
Observations	4,879		4,691		5,015	4,693	5,018	
Number of trainings	123		123		123		123	

Table 3b.

Association of intervention and clinical practice change among primary care settings compared to other settings

	IUD requires only 1 clinic visit		Implant requires only 1 clinic visit	
Main Effects	**Adj OR**	**95% CI**	**Adj OR**	**95% CI**
Training intervention	1.95	[1.34 – 2.83]	1.88	[1.22 – 2.90]
Practice setting				
Planned Parenthood *(Ref)*	-	-	-	-
Primary care	0.74	[0.37 – 1.46]	1.02	[0.54 – 1.94]
Family planning clinic	1.50	[0.78 – 2.89]	1.98	[1.03 – 3.80]
Hospital	2.02	[0.97 – 4.20]	2.27	[1.11 – 4.63]
Other	1.33	[0.70 – 2.53]	1.57	[0.82 – 3.01]
Interaction Terms				
Planned Parenthood *(Ref)*	-	-	-	-
*(Intervention*Primary care)*	1.01	[0.66 – 1.53]	1.05	[0.65 – 1.68]
*(Intervention*Other practices* [a])	0.62	[0.42 – 0.93]	0.61	[0.39 – 0.97]

Adj OR=Adjusted odds ratio, CI = confidence interval.

[a]Family planning/hospital/other. Control variables include provider type, training year, region

Table 4a.

Association of intervention with changes in clinician skills in primary care settings compared to other settings (Clinicians only)

	Clinician skills: comfortable placing							
	Copper IUD		Mirena IUD		Skyla IUD		Subdermal Implant	
Main Effects	**Coef**	**95% CI**	**Adj OR**	**95% CI**	**Adj OR**	**95% CI**	**Adj OR**	**95% CI**
Training intervention	1.86	[1.16 – 3.00]	1.98	[1.16 – 3.37]	3.08	[1.69 – 5.62]	2.45	[1.63 – 3.71]
Practice setting								
Planned Parenthood *(Ref)*	-		-		-		-	
Primary care	0.05	[0.03 – 0.11]	0.07	[0.04 – 0.12]	0.19	[0.10 – 0.36]	0.14	[0.08 – 0.26]
Family planning clinic	0.17	[0.08 – 0.37]	0.15	[0.08 – 0.28]	0.38	[0.20 – 0.74]	0.30	[0.15 – 0.62]
Hospital	0.14	[0.06 – 0.34]	0.16	[0.07 – 0.39]	0.31	[0.14 – 0.66]	0.16	[0.08 – 0.30]
Other	0.06	[0.03 – 0.13]	0.07	[0.04 – 0.13]	0.22	[0.12 – 0.42]	0.16	[0.08 – 0.32]
Interaction Terms								
Planned Parenthood *(Ref)*	-		-		-		-	
*(Intervention*Primary care)*	1.03	[0.57 – 1.87]	1.00	[0.52 – 1.89]	0.89	[0.44 – 1.78]	1.05	[0.63 – 1.78]
*(Intervention*Other practices[a])*	0.91	[0.56 – 1.49]	0.85	[0.49 – 1.47]	0.74	[0.39 – 1.42]	0.93	[0.58 – 1.49]
Observations	2,294		2,29 1		2,264		2,262	
Number of trainings	117		117		117		116	

Table 4b.

Association of intervention with changes in provision in primary care settings compared to other settings (Clinicians only)

	Provided IUDs in last month		Provided implant in last month	
Main Effects	**Adj OR**	**95% CI**	**Adj OR**	**95% CI**
Training intervention	1.51	[1.04 – 2.20]	2.00	[1.39 – 2.87]
Practice setting				
Planned Parenthood *(Ref)*	-	-	-	-
Primary care	0.07	[0.03 – 0.12]	0.11	[0.06 – 0.21]
Family planning clinic	0.22	[0.11 – 0.43]	0.25	[0.13 – 0.50]
Hospital	0.14	[0.07 – 0.29]	0.14	[0.07 – 0.31]
Other	0.08	[0.04 – 0.15]	0.19	[0.10 – 0.37]
Interaction Terms				
Planned Parenthood *(Ref)*	-	-	-	-
*(Intervention*Primary care)*	1.15	[0.73 – 1.80]	1.06	[0.67 – 1.67]
*(Intervention*Other practices[a])*	0.90	[0.59 – 1.38]	0.70	[0.45 – 1.08]
Observations	2,301		2,3 01	
Number of trainings	117		117	

Adj OR=Adjusted odds ratio, CI = confidence interval.

[a]Family planning/hospital/other. Control variables include provider type, training year, and region.