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Continuation of Reversible Contraception in Teenagers and Young Women

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Abstract

Objective—To examine the effect of age on continuation rates of reversible contraceptive methods among teenagers and young women aged 14–19 years and women aged 20–25 years, compared to women older than 25 years of age.

Methods—We analyzed data from 7,472 participants enrolled in the Contraceptive CHOICE Project, a prospective cohort study of women offered no-cost contraception. Our primary objective was to compare 12-month continuation rates between teenagers and women aged 14–19, 20–25, and 26 years and older. We collected data about method continuation from telephone surveys and chart review. We used Kaplan-Meier survival curves to estimate continuation and Cox proportional hazard models to examine the risk of contraceptive method discontinuation.

Results—Twelve-month continuation of long-acting reversible contraceptive (LARC) methods was over 75% for all age groups. Teenagers and young women aged 14–19 years using LARC methods had slightly lower continuation rates (81%) than older women (85–86%), but this did not reach statistical or clinical significance. Compared to women older than 25 years of age, teenagers and women aged 14–19 years had lower continuation rates for non-LARC methods (44% v. 53%; HR_{adj} 1.32, 95% CI 1.02–1.73). The teenagers and young women aged 14–19 years were less likely to be satisfied with non-LARC methods (42% v. 51%; RR_{adj} 0.80, 95% CI 0.65–0.98), but not LARC methods (75% v. 83%; RR 0.94, 95% CI 0.88–1.01) when compared to women over 25 years of age; however, the differences were small.

Conclusion—Teenagers and young women have high rates of LARC method continuation.

INTRODUCTION

Teenage pregnancy accounts for over 750,000 pregnancies each year, of which 82% are unintended (1). A large percentage of unplanned pregnancies also occur among women aged 20 to 24 years at 64% (1). Despite the growing acceptance of long-acting reversible contraceptive (LARC) methods, the most common forms of contraception used by teenagers

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are the male condom, withdrawal, and the oral contraceptive pill (OCP) (2). Prior research indicates that teenagers are more likely to experience method failure with OCPs than women over 30 years of age, and are also less likely to adhere to a daily pill regimen (3–5).

Because of high rates of unintended pregnancy and low use of the most effective methods of contraception, teenagers and young women represent an important group who may benefit from LARC methods. The intrauterine device (IUD) and subdermal etonogestrel (ENG) implant have been shown to be extremely effective in preventing unwanted pregnancy with pregnancy rates of 0.05–0.8% in the first year of use (6). The typical- and perfect-use failure rates are almost identical for LARC methods, in comparison to OCPs and the male condom (6). Despite their high level of effectiveness, LARC methods are used by only a small percentage of women in the United States, and by an even smaller percentage of teenagers and young adults. One study found that only 1.7% of teenagers and women aged 15–24 years had ever used an IUD (7); another reported 4.5% of teenagers and women aged 15–19, and 8.3% of women aged 20–24 years currently use LARC methods (8).

Many experts recommend that LARC methods should be first-line contraceptive options for all women, including teenagers (9–11). Multiple studies have shown LARC methods to be acceptable and safe in young women (10–16), but there are no large-scale studies examining the effect of age on continuation rates. The purpose of this analysis was to examine the effect of age on contraceptive continuation rates in teenagers and young women enrolled in the Contraceptive CHOICE Project. Our hypothesis was that continuation rates among LARC users would not be affected by age, while young age would be associated with higher discontinuation in those using non-LARC methods (i.e. OCP, patch, ring, and depot medroxyprogesterone acetate (DMPA)).

MATERIALS AND METHODS

The Contraceptive CHOICE Project is a prospective cohort study of 9,256 female participants in the St. Louis region. A more detailed description of the methodology of the CHOICE Project has been previously described (17). Prior to initiation of recruitment, the CHOICE protocol was approved by the Washington University in St. Louis School of Medicine Human Research Protection Office. We briefly describe the project and analyses relevant to the present study below.

The primary objectives of CHOICE are to: 1) remove all financial barriers to contraceptive methods; 2) promote the use of the most effective methods of contraception (IUDs and implants); and 3) reduce unintended pregnancies in the St. Louis region. The study sample is a convenience sample of participants recruited from university-affiliated clinics, facilities providing abortion services, community clinics, and through word-of-mouth. Inclusion criteria for CHOICE are: 1) age 14–45 years; 2) no desire for pregnancy in the next year; 3) willing to switch or initiate a new contraceptive method; 4) sexually active with a male partner in the past 6 months or anticipate sexual activity in the next 6 months; and 5) reside in St. Louis city or county or seek clinical services in designated recruitment sites in the St. Louis region. To be included in this analysis, participants had to initiate their baseline chosen contraceptive method within 3 months of enrollment and reach the time point for

their 12-month follow-up survey. Only the participant's initial contraceptive method was included in this analysis.

All participants were read a script that emphasized that IUDs and implants are the most effective reversible contraceptive methods at the time of screening for study eligibility (17). Participants then underwent contraceptive counseling that included information about all FDA-approved reversible methods. The majority of this counseling (74%) was performed by research assistants who were trained contraceptive counselors at the university-based recruitment site. The remainder was performed by clinic staff and/or healthcare providers at the clinical facility providing the counseling (17). Each participant was offered no-cost reversible contraception for 2–3 years (depending on the date of enrollment). Sexually transmitted infection (STI) testing was performed after a face-to-face, standardized baseline survey. All participants were counseled about the risk of STIs and encouraged to use condoms if they were at risk. Participants were then followed with telephone interviews at 3 and 6 months, and every 6 months for the duration of follow-up.

During each follow-up telephone survey, the participant was asked, “are you still using the method?” If yes, she was asked, “did you ever stop using the method?” A “continuer” was a participant who reported using her baseline method at the 3-, 6-, and 12-month surveys without a temporary stop of 1 month or longer. A “discontinuer” was a participant who was not using her baseline method at any of the survey time points, or reported stopping her method for 1 month or longer. When participants missed a survey or completed the survey without answering the method use question, we used additional data sources. Among LARC users we used our contraceptive method allocation and removal log to confirm method use. Participants who were captured as having their IUD or implant removed in the removal log were considered “discontinuers.” For participants who experienced an expulsion of an IUD, replacement was offered. If the IUD was replaced within 1 month, this was considered a “continuer” whereas if the participant elected an alternative form of contraception after expulsion, she was considered a “discontinuer.” For those who used DMPA, OCPs, patch, or the ring, we used the method allocation log and pharmacy refill records to verify their method use. Participants who were lost to follow-up were censored at their last completed survey date.

We stratified participants by age group (14–19, 20–25, and 26 years and older). Continuation rates were then assessed by age within each method group: LARC (IUD and implant) and non-LARC (OCPs, DMPA, patch, or ring) users. Demographic characteristics of the study participants were described using frequencies, percentages, means, and standard deviations where appropriate. We compared baseline characteristics using χ^2 or Fisher exact tests when appropriate for categorical variables, and Student's *t*-test for normally distributed continuous variables. Normality was assessed by evaluating the histogram of continuous variables. We used Kaplan-Meier survival curves to estimate continuation rates, and hazard ratios were estimated using Cox proportional hazard models.

We also compared user satisfaction at 12 months. There were 3 levels of satisfaction: “very satisfied,” “somewhat satisfied,” and “not satisfied.” All discontinuers were considered “not satisfied.” We grouped “very satisfied” and “somewhat satisfied” together and compared

them to “not satisfied” to determine satisfaction at 12 months. We also performed univariable and multivariable Poisson regression with robust error variance to assess factors associated with satisfaction. Poisson regression with robust error variance allows for a conservative estimate of the relative risk when the outcome of interest occurs more than 10% of the time, as was the case with user satisfaction (18). Confounding was defined as a greater than 10% relative change in the association between continuation or satisfaction and age groups with or without the covariate of interest in the model. All the confounding factors were included in the adjusted multivariable model (education, gravidity, history of STI). Analyses were performed using STATA 11. The significance level alpha was set at 0.05.

RESULTS

Among 9,256 participants enrolled in CHOICE Project between August 2007 and September 2011, 7,472 met the inclusion criteria and are included in this analysis. Table 1 presents baseline characteristics of the analytic sample by age group. Participants who were 14–19 years old were more likely to be African American, report trouble paying for basic expenses, and less likely to be uninsured than participants in the older groups. Participants in the youngest age group were also more likely to be nulliparous and less likely to have experienced an unintended pregnancy or an STI.

The 12-month LARC continuation rates were greater than 75%, and higher than non-LARC methods for all age groups as shown in Table 2. LARC continuation ranged from 81% in 14–19 year-olds to 86% in women older than 25 years. The levonorgestrel intrauterine system (LNG-IUS) had the highest 12-month continuation rate (86–87%) in both the 20–25 year and 26 years and older age groups. Participants age 26 and older reported LARC continuation rates over 84% (LNG-IUS 86%, copper IUD 86%, and implant 84%;). Non-LARC method continuation was 44% for 14–19 year-olds and 53% in the oldest group. Teenagers and young women (14–19 years) who used the ring reported the lowest 12-month continuation rate (31%), whereas women aged 20–25 and 26 and older reported the lowest continuation with the contraceptive patch (40 and 41%, respectively).

Table 3 provides satisfaction rates at 12 months by contraceptive method stratified by age. Loss to follow-up at 12 months was 6%. Satisfaction rates were higher for LARC users regardless of age (75% for age 14–19, 82% for age 20–25, and 83% for age 26 years and older), compared to non-LARC users (42% for age 14–19, 49% for age 20–25 and 51% for age 26 years and older). Teenagers and young women aged 14–19 reported the highest rates of being “not satisfied” with the ring (69%), patch (65%), DMPA (57%), and OCPs (54%). Participants aged 14–19 years were less likely to be satisfied overall with non-LARC methods (RR_{adj} 0.80, 95% CI 0.65–98), but this difference was not seen with LARC methods (RR_{adj} 0.94, 95% CI 0.88–1.01). The differences observed in satisfaction were small and may not be clinically significant.

DISCUSSION

Among participants in the Contraceptive CHOICE Project, we found that teenagers and young women aged 14–19 years had lower continuation rates of non-LARC methods when compared with older women. We found little difference in the continuation rates of LARC methods by age group; over 75% of participants of all ages were still using their LARC method at 12 months.

We noted slightly lower continuation rates among adolescents using the copper IUD when compared with older women (76% versus 86%). However, this difference was not statistically significant. We had limited power to detect differences by age group in copper IUD users due to the small number of participants aged 14–19 years using the copper IUD (n=55).

The youngest age group expressed slightly less satisfaction with all contraceptive methods compared to older women. Participants aged 14–19 years using OCPs, the patch, ring, or DMPA had the lowest satisfaction rates with more than half being “not satisfied.” Dissatisfaction was especially true for the patch (65%) and the ring (69%). In 2008, Creinin et al performed a randomized controlled trial comparing 3-month continuation rates of the patch compared with the ring (19). They found that 3-month continuation of the ring was higher than the patch (95% vs. 88%, $p=0.03$). However, when asked if participants intended to continue use of their assigned method after study completion, only 71% and 26% reported intent to continue the ring and patch, respectively.

The finding that participants aged 14–19 years are less likely to continue non-LARC methods is consistent with previous studies. Raine et al. conducted a 12-month longitudinal cohort study of 1,387 adolescent girls and women aged 15 to 24 years using OCPs, patch, ring, and DMPA for contraception (20). Continuation was independently associated with method type and younger age (lower continuation in younger participants). Continuation was lowest for the patch and DMPA. LARC methods were not included in this report.

Little evidence is available regarding continuation and satisfaction with IUDs in teenagers and young women (11), and data are especially sparse with regard to the copper IUD. Rasheed et al conducted a prospective cohort study of 281 women 13–19 years of age and 571 older women (age 20–30 years) at a family planning clinic who underwent placement of the copper IUD (21). This study included only primiparous women who had an IUD placed 6 to 8 weeks post-delivery, and had a fairly high rate of loss to follow-up (21% completed follow up at 6 months). At one month post-insertion, they noted that women 13–19 years of age had higher rates of pain, bleeding, displacement, expulsion, and removal than older women. At 6 months, women 13–19 years of age had equivalent rates of removal compared with older women. Godfrey et al conducted a small pilot study randomizing women aged 14–18 years to the LNG-IUS or the copper IUD (14). They found 6-month continuation rates of 75% for the LNG-IUS and 45% for the copper IUD. This study was limited by its small sample size (n=23). Additional studies evaluating the copper IUD in young women are needed.

Overall, 12-month continuation rates for the ENG implant range between 75 and 91% (22–24). A study comparing continuation and satisfaction between women using either the LNG-IUS or the ENG implant found similar 6-month continuation rates at 89% and 83%, respectively (25). However, satisfaction was lower among implant users (74% and 58%, respectively, $p=0.002$). This study did not stratify their population by age or specifically evaluate teenagers. In fact, there are few studies evaluating continuation of the ENG subdermal implant in adolescents. A prospective observational study of 171 females aged 13–24 years who received immediate postpartum implants found that 86% were still using the implant at 12-months (26). Repeat pregnancy rates at 12 months were significantly lower among implant users at 3%, compared to 19% among users of other contraceptive methods. The generalizability of these results is limited by the exclusively postpartum adolescent population. In a previous CHOICE analysis, we found that teenagers (age 14–17 years) were more likely to favor the implant over the IUD, compared to women between 18–20 years of age (12). These findings suggest that adolescents may prefer the implant for long-acting and highly effective contraception.

The strengths of our study include its large sample size, prospective design, low rate of loss to follow-up at 12 months (6%), and evaluation of all forms of reversible contraception. Limitations of our study include our requirement that participants start a new contraceptive method, utilization of a convenience sample, and recruitment limited to the St. Louis region which may limit the generalizability of our findings. Another potential limitation of our study is that continuation was self-reported and therefore subject to reporting bias. In addition, methods were provided at no cost which could have resulted in higher continuation of refillable methods (OCPs, patch, ring) and DMPA. However, our 12-month continuation rates for these methods are comparable to other reports (20, 27–30).

Teenagers and young women represent a population at especially high risk for sexually transmitted infections. Barrier methods are the best way to prevent STIs, and clinicians should continue to encourage condom use for STI prevention. An ideal approach in counseling teenagers and young women should emphasize dual method use, utilizing reliable contraception for pregnancy prevention and condom use to prevent STIs.

Given the high rates of continuation and satisfaction of LARC methods among teenagers and young women, long-acting reversible contraception should be offered to women of all ages as first-line contraceptive methods in order to best serve females who want to prevent unintended pregnancy.

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REFERENCES

1. Finer LB, Henshaw SK. Disparities in the rates of unintended pregnancy in the United States, 1994 and 2001. *Perspectives of Sexual Reproductive Health*. 2006; 38:90–96.

2. Martinez G, Copen CE, Abma JC. Teenagers in the United States: Sexual activity, contraceptive use, and childbearing, 2006-2010 National Survey of Family Growth. National Center for Health Statistics. Vital Health Statistics. 2011; 23(31)
3. Kost K, Singh S, Vaughan B, Trussell J, Bankole A. Estimates of contraceptive failure from the 2002 National Survey of Family Growth. *Contraception*. 2008; 77(1):10–21. [PubMed: 18082661]
4. Woods JL, Shew ML, Tu W, Ofner S, Ott MA, Fortenberry JD. Patterns of oral contraceptive pill-taking and condom use among adolescent contraceptive pill users. *Journal of Adolescent Health*. 2006 Sep; 39(3):381–387. [PubMed: 16919800]
5. Winner B, Peipert JF, Zhao Q, Buckel C, Madden T, Allsworth JE, Secura GM. Effectiveness of long-acting reversible contraception. *NEJM*. 2012; 366:1998–2007. [PubMed: 22621627]
6. Hatcher, RA.; Trussell, J.; Nelson, AL.; Cates, W.; Stewart, FH.; Dowal, D. *Contraceptive Technology*. New York: Ardent Media, Inc.; 2007.
7. Whitaker AK, Dude AM, Neustadt A, Gilliam ML. Correlates of use of long-acting reversible methods of contraception among adolescent and young adult women. *Contraception*. 2010; 81:299–303. [PubMed: 20227545]
8. Finer LB, Jerman J, Kavanaugh ML. Changes in use of long-acting contraceptive methods in the United States, 2007-2009. *Fertility and Sterility*. 2012 published online 16 July 2012.
9. Peipert JF, Zhao Q, Allsworth JE, Petrosky E, Madden T, Eisenberg D, Secura G. Continuation and satisfaction of reversible contraception. *Obstetrics and Gynecology*. 2011; 117(5):1105–1113. [PubMed: 21508749]
10. Gold MA, Johnson LM. Intrauterine devices and adolescents. *Current opinion in obstetrics and gynecology*. 2008; 20:464–469. [PubMed: 18797269]
11. Deans EI, Grimes DA. Intrauterine devices for adolescents: a systematic review. *Contraception*. 2009; 79:418–423. [PubMed: 19442775]
12. Mestad R, Secura G, Allsworth JE, Madden T, Zhao Q, Peipert JF. Acceptance of long-acting reversible contraceptive methods by adolescent participants in the Contraceptive CHOICE Project. *Contraception*. 2011; 84:493–498. [PubMed: 22018123]
13. Teal SB, Sheeder J. IUD use in adolescent mothers: retention, failure and reasons for discontinuation. *Contraception*. 2012; 85(3):270–274. [PubMed: 22067773]
14. Godfrey EM, Memmel LM, Neustadt A, Shah M, Nicosia A, Moorthie M, Gilliam M. Intrauterine contraception for adolescents aged 14-18 years: a multicenter randomized pilot study of Levonorgestrel-releasing intrauterine system compared to the Copper T 380A. *Contraception*. 2010; 81:123–127. [PubMed: 20103449]
15. Suhonen S, Haukkamaa M, Jakobsson T, Raurama I. Clinical performance of levonorgestrel-releasing intrauterine system and oral contraceptives in young nulliparous women: a comparative study. *Contraception*. 2004; 69:407–412. [PubMed: 15105064]
16. Lara-Torre E, Spotswood L, Correia N, Weiss P. Intrauterine contraception in adolescents and young women: a descriptive study of use, side effects, and compliance. *Journal of Pediatric and Adolescent Gynecology*. 2011; 24:39–41. [PubMed: 21262478]
17. Secura FM, Allsworth JE, Madden T, Mullersman JL, Peipert JF. The Contraceptive CHOICE Project: reducing barriers to long-acting reversible contraception. *American Journal of Obstetrics and Gynecology*. 2010; 203 115.e1-7.
18. Zou G. A modified poisson regression approach to prospective studies with binary data. *American Journal of Epidemiology*. 2004; 159(7):702–706. [PubMed: 15033648]
19. Creinin MD, Meyn LA, Borgatta L, Barnhart K, Jensen J, Burke AE, Westhoff C, Gilliam M, Dutton C, Ballagh SA. Multicenter comparison of the contraceptive ring and patch. *Obstetrics and Gynecology*. 2008; 111(2):267–277. [PubMed: 18238962]
20. Raine TR, Foster-Rosales A, Upadhyay UD, Boyer CB, Brown BA, Sokoloff A, Harper CC. One-year contraceptive continuation and pregnancy in adolescent girls and women initiating hormonal contraceptives. *Obstetrics and Gynecology*. 2011; 117:363–371. [PubMed: 21252751]
21. Rasheed SM, Abdelmonem. Complications among adolescents using copper intrauterine contraceptive devices. *International Journal of Gynecology and Obstetrics*. 2011; 115:269–272. [PubMed: 21872240]

22. Arribas-Mir L, Rueda-Lozano D, Agrela-Cardona M, Cedeno-Benavides T, Olvera-Porcel C, Bueno-Cavanillas A. Insertion and 3-year follow-up experience of 372 etonogestrel subdermal contraceptive implants by family physicians in Granada, Spain. *Contraception*. 2009; 80(5):457–462. [PubMed: 19835720]
23. Lakha F, Glasier AF. Continuation rates of implanon in the UK: data from an observational study in a clinical setting. *Contraception*. 2006; 74(4):287–289. [PubMed: 16982226]
24. Short M, Dallay D, Omokanya S, Hanisch JU, Inki P. Acceptability of the levonorgestrel releasing-intrauterine system and etonogestrel implant: one-year results of an observational study. *European Journal of Contraception and Reproductive Health Care*. 2012; 17(1):79–88. [PubMed: 22200172]
25. Wong RC, Bell RJ, Thunuguntla K, McNamee K, Vollenhoven B. Implanon users are less likely to be satisfied with their contraception after 6 months than IUD users. *Contraception*. 2009; 80(5): 452–456. [PubMed: 19835719]
26. Tocce K, Sheeder J, Teal SB. Rapid repeat pregnancy in adolescents: do immediate postpartum contraceptive implants make a difference? *American Journal of Obstetrics and Gynecology*. 2012; 206 481.e1-7.
27. Leite IC, Gupta N. Assessing regional differences in contraceptive discontinuation, failure, and switching in Brazil. *Reproductive Health*. 2007; 4:6. [PubMed: 17623076]
28. Lete I, Perez-Campos E, Correa M, Robledo J, de la Viuda E, Martinez T, Mendoza N, Parera N, Gonzalez JV, Gomez MA, Castelo-Branco C, Lobo P. Continuation rate of combined hormonal contraception: a prospective multicenter study. *Journal of Women's Health*. 2012; 21(5):490–495.
29. Zibners A, Cromer BA, Hayes J. Comparison of continuation rates for hormonal contraception among adolescents. *Journal of Pediatric and Adolescent Gynecology*. 1999; 12:90–94. [PubMed: 10326194]
30. Dinerman LM, Wilson MD, Duggan AK, Joffe A. Outcomes of adolescents using levonorgestrel implants vs. oral contraceptives or other contraceptive methods. *Archives of Pediatric and Adolescent Medicine*. 1995; 149:967–972.

Table 1

Baseline Characteristics of Analysis Group by Age

	14–19 (n=1099)		20–25 (n=3417)		26+ (n=2956)		P
	Mean	SD	Mean	SD	Mean	SD	
Age	17.7	1.4	22.6	1.7	31.0	4.5	<0.001
	n	%	n	%	n	%	
Race							<0.001
Black	672	61.1	1545	45.2	1483	50.2	
White	341	31.0	1581	46.3	1266	42.8	
Others	86	7.8	291	8.5	206	7.0	
Education							<0.001
High school or less	786	71.5	1013	29.7	772	26.1	
Some college	311	28.3	1614	47.3	1231	41.7	
College or graduate degree	2	0.2	788	23.1	952	32.2	
BMI							<0.001
Underweight	47	4.3	118	3.5	52	1.8	
Normal Weight	571	52.0	1442	42.2	922	31.2	
Overweight	249	22.7	865	25.3	806	27.3	
Obese	232	21.1	992	29.0	1176	39.8	
Receiving public assistance							<0.001
No	796	72.5	2159	63.2	1798	60.9	
Yes	302	27.5	1255	36.8	1156	39.1	
Trouble paying for basic expenses							<0.001
No	824	75.2	2048	60.0	1639	55.5	
Yes	272	24.8	1366	40.0	1312	44.5	
Insurance							<0.001
None	315	29.6	1450	42.5	1340	45.5	

	14–19 (n=1099)		20–25 (n=3417)		26+ (n=2956)		P
	Mean	SD	Mean	SD	Mean	SD	
Gravidity							<0.001
Private	463	43.5	1452	42.6	1299	44.1	
Public	287	26.9	506	14.8	309	10.5	
0	540	49.1	1244	36.4	458	15.5	
1	395	35.9	807	23.6	401	13.6	
2	127	11.6	634	18.6	587	19.9	
3 or more	37	3.4	732	21.4	1510	51.1	
Parity							<0.001
0	848	77.2	1914	56.0	770	26.0	
1	212	19.3	914	26.7	702	23.7	
2	34	3.1	435	12.7	832	28.1	
3 or more	5	0.5	154	4.5	652	22.1	
Unintended pregnancies							<0.001
0	568	51.8	1372	40.2	761	25.8	
1	389	35.5	946	27.7	671	22.7	
2	114	10.4	579	17.0	565	19.1	
3+	26	2.4	514	15.1	954	32.3	
History of abortion							<0.001
No	886	80.6	2296	67.2	1600	54.1	
Yes	213	19.4	1121	32.8	1356	45.9	
History of STI							<0.001
No	820	74.6	2103	61.6	1588	53.7	
Yes	279	25.4	1312	38.4	1367	46.3	
Any current STI							0.40
No	952	92.2	3063	92.7	2661	93.3	
Yes	81	7.8	240	7.3	190	6.7	

	14-19 (n=1099)		20-25 (n=3417)		26+ (n=2956)		P
	Mean	SD	Mean	SD	Mean	SD	
Baseline chosen method							<0.001
LNG-IUS	330	30.0	1527	44.7	1508	51.0	
Copper IUD	55	5.0	313	9.2	516	17.5	
Implant	378	34.4	532	15.6	304	10.3	
OCPs	146	13.3	385	11.3	209	7.1	
Ring	57	5.2	344	10.1	172	5.8	
DMPA	112	10.2	244	7.1	201	6.8	
Patch	21	1.9	72	2.1	46	1.6	
Natural family planning							
Diaphragm							

SD, standard deviation; BMI, body mass index; STI, sexually transmitted infection; LNG-IUD, levonorgestrel intrauterine system; IUD, intrauterine device; OCP, oral contraceptive pill; DMPA, depot medroxyprogesterone acetate;.

Table 2
Continuation Rates at 12 Months by Contraceptive Method, Stratified by Age and Hazard Ratio of Risk of Discontinuation

Method	Age	n	Continuation Rate (%)	Crude Hazard Ratio [95% CI]	Adjusted Hazard Ratio [95% CI]*
LNG-IUS	14–19	330	80.6	1.44[1.08–1.92]	1.25[0.83–1.88]
	20–25	1527	86.8	0.97[0.79–1.18]	0.95[0.76–1.17]
	26 or older	1508	86.4	Ref	Ref
Copper IUD	14–19	55	75.6	1.93[1.07–3.50]	1.24[0.54–2.85]
	20–25	313	82.5	1.33[0.93–1.90]	1.25[0.85–1.85]
	26 or older	516	85.9	Ref	Ref
Implant	14–19	378	82.2	1.15[0.78–1.69]	1.12[0.59–2.11]
	20–25	532	80.1	1.28[0.90–1.83]	1.27[0.87–1.87]
	26 or older	304	84.4	Ref	Ref
DMPA	14–19	112	47.3	1.17[0.84–1.63]	1.63[0.99–2.64]
	20–25	244	57.1	0.91[0.69–1.21]	1.01[0.74–1.40]
	26 or older	201	53.4	Ref	Ref
OCPs	14–19	146	46.7	1.21[0.89–1.64]	1.21[0.78–1.87]
	20–25	385	51.6	1.04[0.81–1.34]	1.14[0.86–1.51]
	26 or older	209	53.9	Ref	Ref
Patch	14–19	21	40.9	1.00[0.49–2.01]	0.71[0.26–1.98]
	20–25	72	39.7	1.00[0.61–1.62]	0.90[0.53–1.51]
	26 or older	46	40.7	Ref	Ref
Ring	14–19	57	31.0	1.69[1.14–2.50]	1.71[1.01–2.89]
	20–25	344	52.2	1.05[0.80–1.38]	1.06[0.78–1.45]
	26 or older	172	53.1	Ref	Ref
LARC	14–19	763	81.0	1.38[1.12–1.69]	1.22[0.89–1.68]
	20–25	2372	84.7	1.10[0.94–1.28]	1.07[0.91–1.27]
	26 or older	2328	86.0	Ref	Ref

Method	Age	n	Continuation Rate (%)	Crude Hazard Ratio [95% CI]	Adjusted Hazard Ratio [95% CI]*
Non-LARC	14–19	336	44.0	1.25[1.04–1.50]	1.32[1.02–1.73]
	20–25	1045	52.3	1.01[0.88–1.17]	1.07[0.91–1.27]
	26 or older	628	52.6	Ref	Ref

CI, confidence interval; LNG-IUS, levonorgestrel intrauterine system; IUD, intrauterine device; DMPA, depot medroxyprogesterone acetate; OCPs, oral contraceptive pills; LARC, long-acting reversible contraceptive.

* Adjusted for age, gravidity, and history of a sexually transmitted infection.

Table 3

Satisfaction at 12 Months by Contraceptive Method, Stratified by Age

Method	Age	Very Satisfied	Somewhat Satisfied	Not Satisfied	Crude Relative Risk [95% CI]	Adjusted Relative Risk [95% CI]*
LNG-IUS	14–19	193(65.7)	34(11.6)	67(22.8)	0.92[0.86–0.99]	0.96[0.88–1.05]
	20–25	931(68.3)	212(15.6)	220(16.1)	1.00[0.97–1.04]	1.00[0.97–1.04]
	26	954(68.1)	201(14.6)	226(16.4)	Ref	Ref
Copper IUD	14–19	28(56.0)	8(16.0)	14(28.0)	0.88[0.73–1.05]	0.99[0.82–1.19]
	20–25	176(63.3)	42(15.1)	60(21.6)	0.95[0.89–1.03]	0.97[0.90–1.05]
	26 or older	298(64.9)	79(17.2)	82(17.9)	Ref	Ref
Implant	14–19	175(54.0)	65(20.1)	84(25.9)	0.93[0.85–1.01]	0.88[0.76–1.01]
	20–25	253(52.6)	119(24.7)	109(22.7)	0.97[0.90–1.05]	0.94[0.87–1.02]
	26 or older	154(56.4)	64(23.4)	55(20.2)	Ref	Ref
DMPA	14–19	38(37.3)	6(5.9)	58(56.9)	0.87[0.67–1.13]	0.70[0.47–1.06]
	20–25	95(42.0)	26(11.5)	105(46.5)	1.08[0.89–1.30]	1.00[0.80–1.24]
	26 or older	71(38.0)	22(11.8)	94(50.3)	Ref	Ref
OCPs	14–19	48(33.1)	19(13.1)	78(53.8)	0.88[0.71–1.10]	0.87[0.66–1.15]
	20–25	145(39.7)	33(9.0)	187(51.2)	0.93[0.78–1.10]	0.87[0.72–1.05]
	26 or older	72(36.4)	32(16.2)	94(47.5)	Ref	Ref
Patch	14–19	6(30.0)	1(5.0)	13(65.0)	0.85[0.42–1.69]	1.18[0.43–3.23]
	20–25	19(26.8)	6(8.5)	46(64.8)	0.85[0.53–1.36]	1.02[0.61–1.72]
	26 or older	16(34.8)	3(6.5)	27(58.7)	Ref	Ref
Ring	14–19	16(29.1)	1(1.8)	38(69.1)	0.57[0.37–0.86]	0.57[0.32–1.01]
	20–25	141(41.6)	30(8.9)	168(49.6)	0.93[0.78–1.10]	0.92[0.76–1.12]
	26 or older	85(50.3)	7(4.1)	77(45.6)	Ref	Ref
LARC	14–19	396(59.3)	107(16.0)	165(24.7)	0.91[0.87–0.95]	0.94[0.88–1.01]
	20–25	1360(64.1)	373(17.6)	389(18.3)	0.99[0.96–1.01]	0.99[0.96–1.02]

Method	Age	Very Satisfied	Somewhat Satisfied	Not Satisfied	Crude Relative Risk [95% CI]	Adjusted Relative Risk [95% CI] *
	26+	1406(66.5)	344(16.3)	363(17.2)	Ref	Ref
Non-LARC	14–19	108(33.5)	27(8.4)	187(58.1)	0.82[0.70–0.95]	0.80[0.65–0.98]
	20–25	400(40.0)	95(9.5)	506(50.6)	0.96[0.87–1.06]	0.92[0.82–1.03]
	26+	244(40.7)	64(10.7)	292(48.7)	Ref	Ref

* Adjusted for education, gravidity, and history of sexually transmitted infections.

CI, confidence interval; LNG-IUS, levonorgestrel intrauterine system; IUD, intrauterine device; DMPA, depot medroxyprogesterone acetate; OCPs, oral contraceptive pills; LARC, long-acting reversible contraceptive.

Data are n(%) unless otherwise specified.