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**The Thesis Committee for Brooke Whitfield
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**Primary contraceptive method use and sexually transmitted infections
in a nationally representative sample of young women**

**APPROVED BY
SUPERVISING COMMITTEE:**

Kari White, Supervisor

Abigail Weitzman

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by

Brooke Whitfield

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Abstract

Primary contraceptive method use and sexually transmitted infections in a nationally representative sample of young women

Brooke Whitfield, MA

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Supervisor: Kari White

Rates of sexually transmitted infections (STIs) in the U.S. have increased for the sixth consecutive year and people ages 15-24 account for over half of all new infections despite comprising only a quarter of the sexually active population. A potential explanation for rising STI rates is the increased use of long-acting reversible contraceptive (LARCs) methods which may result in lower condom use and/or increased sexual risk-taking due to higher pregnancy prevention efficacy. This paper uses the National Survey of Family Growth to examine the relationship between primary contraceptive method use among women ages 15-24 and STI treatment in the past year, and the extent to which this association is mediated by relationship status and frequency of condom use. Findings did not show differences in STI treatment in the past year by primary contraceptive method indicating that LARC use among young women does not equate to increased STI risk. Findings did show that young women who had been in only

casual relationships or a mix of serious, dating, and/or casual relationships in the past year were more likely to have been treated for an STI than young women in serious- or dating-only relationships, regardless of primary method use. Additionally, young women who reported using condoms only “some of the time” were more likely to have been treated for an STI in the past 12 months compared to women who used condoms “all of the time” or “most of the time.” This association was moderately mediated by relationship status ($p=0.05$).

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INTRODUCTION

Despite being at record lows two decades ago, sexually transmitted infection (STI) rates have peaked for the sixth consecutive year.¹ In 2019, 2.5 million cases of chlamydia, gonorrhea, and syphilis were reported, a nearly 30% increase since 2015.¹ Young people ages 15-24 account for over half of all new STIs each year, despite making up only one-quarter of the sexually active population.¹ These infections can have long-term health consequences – particularly for women – if left untreated, including pelvic inflammatory disease, infertility, and pregnancy complications.

Reproductive health scholars have hypothesized that the increased use of long-acting reversible contraceptives (LARCs), such as implants and intrauterine devices (IUDs), may result in increased STIs due to lower condom use and/or increases in sexual risk-taking behaviors as a result of higher pregnancy prevention efficacy compared to other contraceptive methods.^{2,3,4} Between 2008 and 2016, IUD use rose from 3% to 6% among those ages 15-19 and from 6% to 10% for those ages 20-24,^{5,6} and implant use rose from 0.3% to 16% and from 1% to 8%, respectively.^{5,6} Prior studies focusing on young people have documented lower condom use among LARC users compared to non-LARC users,^{3,7,8} but few studies have investigated whether STIs are higher among LARC users than non-LARC users, and findings have been inconclusive.^{2,9,10} Only one study to date has used a nationally representative sample, but it focused on the impacts of an intervention aimed at improving providers' LARC method-specific knowledge, patient-centered counseling, and IUD placement skills on STI incidence.¹¹

Using a nationally representative sample of young women ages 15-24, this paper aims to examine the relationship between primary contraceptive method use and STIs, and the extent to which this association is mediated by relationship status and frequency of condom use. Research

shows that contraceptive method used, relationship status, and frequency of condom use are highly inter-related. Women in serious relationships are less likely to use condoms because of higher trust in their partner but are more likely to use more effective contraceptive methods, likely attributed to more frequent sex.¹² Despite lower levels of condom use, these women may be at low risk for STIs.¹³ Conversely, women who use more effective contraceptive methods but are not in serious relationships may similarly use condoms with less frequency, due to higher protection against pregnancy, but may be at higher risk for STIs due to concurrent partners. Based on prior literature I hypothesize, (1) women using a LARC as their primary contraceptive method will have lower condom use than women using a primary method with lower efficacy, such as short-acting hormonal or coital-dependent methods; (2) women using a LARC as their primary method will have greater STI risk than women using a primary method with lower efficacy; and (3) the association between primary method and STIs can be explained by frequency of condom use and/or relationship status.

METHODS

Study Design and Sample

This study uses data from the National Survey of Family Growth (NSFG), a nationally representative survey of women and men aged 15-44 that collects information on family formation, contraception, and sexual health. The NSFG uses a multistage probability sampling design that oversamples Black, Hispanic, and adolescents.¹⁴ I pooled data from the 2011-2019^a female respondent files (N=22,995) and restricted the sample to those with high STI rates: young

^a In 2011, the NSFG began asking participants “In the past 12 months, have you been treated or received medication from a doctor or other medical care provider for a sexually transmitted disease like gonorrhea, chlamydia, herpes, or syphilis?”

women ages 15-24 who had been sexually active in the past 12 months. Given the study's emphasis on contraceptive use, I removed women who were pregnant or trying to get pregnant in the past 12 months. The analytic sample included 3,687 women. This study was exempt from Institutional Review Board review, given the de-identified nature of this publicly available data.

The primary outcome was a binary measure of whether a respondent received treatment for an STI in the past 12 months (a proxy for STI incidence). Primary method was categorized as LARC (IUD and contraceptive implants), short-acting hormonal method (oral contraceptive pills, contraceptive patches, and rings), condoms, coital-dependent method (fertility awareness-based methods, sponges, diaphragms, withdrawal, female condoms, spermicide, emergency contraception, or other method), or no method. Using the NSFG contraceptive calendar data,^b I determined the most effective method a respondent used each month they were sexually active during the 12 months preceding the interview. I then created a variable indicating the method used most frequently by the respondent in the past 12 months. If a respondent reported using two (or more) methods with equal frequency, I used the most effective method.

Frequency of condom use during sexual intercourse in the past 12 months was categorized as "None of the time," "Some or half of the time," "Most of the time," or "All of the time." Relationship status was constructed using three variables which asked respondents' relationship status at first sex with their three most recent male partners. I created a categorical variable to indicate whether a participant had been in serious-only relationships in the past 12 months (married, engaged, or living together in a sexual relationship), dating-only relationships (going out with him or going steady), casual-only relationships (going out with him once in a

^b The NSFG includes a contraceptive calendar where female respondents report up to four contraceptive methods used in each month during the three years prior to the interview.

while, just friends, had just met him, or something else) or a mix of serious, dating, and/or casual relationships.

Statistical Analyses

I conducted chi-squared tests and multivariable-adjusted logistic regression models to assess whether women using LARC methods were less likely to use condoms (hypothesis 1), whether women using LARC methods were more likely to have received treatment for an STI in the past 12 months (hypothesis 2), and whether women who used condoms more frequently and women in serious-only relationships were less likely to have received treatment for an STI (hypothesis 3).

To formally assess the second and third hypotheses, I conducted a series of multivariable-adjusted logistic regression models. I first added relationship status to the model, to evaluate whether women in serious-only relationships were less likely to have been treated for an STI, and then added frequency of condom use, to assess whether women who more frequently used condoms were less likely to have been treated for an STI. The final model included both relationship status and frequency of condom use. Each model controlled for age, race/ethnicity, age at first sex, number of lifetime male sexual partners, and frequency of sex in past month.^c

To examine whether relationship status mediates the association between condom use and STI treatment, I conducted a formal mediation analysis using the Karlson-Holm-Breen (KHB) method.¹⁵ The KHB method decomposes the total effects of a predictor variable (frequency of condom use in this study) on the outcome variable (STI treatment) into indirect

^c Interview year was added to control for potential increases in STI testing over time but was not significantly associated and was removed from the models.

effects (portion explained by mediating variable: relationship status) and direct effects (remaining portion explained by frequency of condom use). All control variables were included in KHB models.

Lastly, I conducted sensitivity analyses to assess whether findings were consistent when limiting the sample to women who used the same contraceptive method for the past 12 months (N=1,002). This was done to account for potential temporality issues since the NSFG does not record date of STI incidence and there may be confounding factors that influence STI risk when a woman switches methods. Analyses were conducted with Stata 16.1 and estimates were weighted using the combined 2011-2019 NSFG female respondent weights.

RESULTS

Descriptive analyses

Mean age of respondents was 21 years and mean age of sexual debut was 16 years (Table 1). Approximately 22% identified as Hispanic, 15% as non-Hispanic Black, and nearly two-thirds (64%) reported a family income below \$50,000. Young women reported an average of five lifetime male sexual partners and 12 sexual encounters in the past four weeks. Most reported using short-acting hormonal methods as their primary method (42%), followed by condoms (28%) and LARCs (12%). Over half (53%) had been in dating-only relationships in the past 12 months and over one-quarter (27%) had been in casual-only relationships.

With the exception of women using condoms as their primary contraceptive method, frequency of condom use during sex in the past 12 months was low (Figure 1). Short-acting hormonal method users had the highest reported frequency of condom use during sex: 23% reported using a condom every time and over two-thirds (68%) reported using condoms at least some of the time. Women who used condoms or short-acting hormonal methods as their primary

method were significantly more likely to use condoms than women using LARCs or coital-dependent methods.

Overall, 9% of the sample received treatment for an STI in the past 12 months. There were no significant differences in STI treatment by primary contraceptive method (Figure 2). However, respondents who reported using condoms only “some of the time” were significantly more likely to have been treated for an STI compared to other frequencies of condom use. Additionally, respondents who had been in serious- or dating-only relationships were significantly less likely to have been treated for an STI (3% and 6%, respectively) compared to those in casual-only or a mix of serious, dating, and/or casual relationships (10% and 16%, respectively). Respondents who had been in a mix of serious, dating, and/or casual relationships were most likely to have been treated for an STI.

The relationship between primary contraceptive method used and STI treatment

Table 2 shows that LARC primary method use was not associated with STI treatment in the past 12 months (Model 1, OR: 1.41; 95% CI: [0.87 – 2.27]). However, young women in casual-only (Model 2, OR: 2.39; 95% CI: [1.11 – 5.14]) or a mix of serious, dating, and/or casual relationships (Model 2, OR: 3.78; 95% CI: [1.66 – 8.62]) had 2-3 times the odds of STI treatment compared to women in serious-only relationships. Additionally, women who used a condom only “some or half of the time” had more than twice the odds of being treated for an STI compared to women who used a condom “all of the time” (Model 3, OR: 2.09; CI: [1.32 – 3.33]). When both relationship status and condom use frequency were included in the same model (Model 4), significant findings remained. Race, number of sexual partners, and age at first sex were also significant predictors of STI treatment: Black women, women with higher numbers

of sexual partners, and women who were younger at first sex had higher odds of being treated for an STI.

Relationship status as a mediator of condom use and STI treatment

In the formal mediation analyses, condom use “some or half of the time” has a large, direct effect on STI treatment in the past 12 months (Table 3). Relationship status accounts for 10% of this association between using condoms “some or half of the time” and STI treatment ($p=0.05$).

Sensitivity analyses for women using the same method for 12 months

Women who used the same contraceptive method for the past 12 months were older, more likely to be white, more likely to use a LARC or short-acting hormonal method as their primary method, more likely to be in dating-only relationships, had more frequent sex, and less frequent condom use than the study sample (Appendix A). Nonetheless, STI treatment rates were similar for women who used the same contraceptive method (7.1%) and the study sample (8.7%) ($p=0.111$).

Despite significant demographic differences, results from logistic regression models showed similar associations between primary method use and STI treatment and frequency of condom use and STI treatment across samples (Appendix B). However, the association between relationship status and STI treatment was not significant for women who had used the same contraceptive method. This may be attributed to small samples sizes for relationship categories in the sensitivity analysis sample.

DISCUSSION

Both STI rates and use of LARC methods among young people ages 15-24 have steadily increased over the past six years.^{1,5,6} This study assessed whether LARC use among young people is associated with higher rates of receiving treatment for an STI in the past 12 months (as a proxy for STI incidence). Findings from this study do not provide evidence to support the idea that increased LARC is contributing to the growing STI burden among young people.

The study did, however, find significant differences in STI treatment by relationship status and frequency of condom use. Young women who had been in casual-only relationships or a mix of serious, dating, and/or casual relationships were more likely to have been treated for an STI than young women in serious- or dating-only relationships, regardless of primary method use. Additionally, young women who reported using condoms only “some of the time” were more likely to have been treated for an STI compared to women who used condoms “all” or “most of the time,” which is to be expected since inconsistent condom use can result in increased STI risk. Interestingly, women who reported using condoms “none of the time” had no significant differences in STI treatment compared to women who used condoms “all of the time.” A potential explanation could be that women who never used condoms were in relationships where they had higher trust in their partner, were having sex infrequently, or were having sex with same-sex partners. These potential explanations should be further explored in future research.

Mediation analyses revealed that relationship status may mediate the relationship between using a condom “some of the time” and being treated for an STI. Findings were only marginally significant ($p=0.05$), which may partially be explained by the small sample size of women in serious relationships but suggest that relationship status may explain part of the

association between condom use and STI treatment. Future research should include larger samples of women in diverse relationship structures to examine this potential mediating effect.

Given the importance of consistent condom use at preventing STIs, efforts to address the increasing STI burden should be directed at expanding access to comprehensive, gender-equitable sexual health education and services. Young people face multiple barriers to exercising reproductive autonomy, including a lack of comprehensive sexual education,¹⁶ little guidance on healthy relationships and sexual communication,¹⁷ and difficulty accessing confidential reproductive health services.¹⁸ Sexual health education can empower young people to protect themselves. However, special attention must be paid to racial inequities. Consistent with previous literature, this study found that Black women had increased risk for STIs.¹ Black women are less likely to have access to a pharmacy or other health services,^{19,20} are more likely to have experienced sexual violence,²¹ and are more likely to have first intercourse earlier than their white counterparts²² – all of which increases risk for STIs.^{20,23,24} Sexual health programming must therefore acknowledge racial injustices in order to address rising STI rates.

This study has several limitations. First, since the NSFG does not include a measure of STI incidence, I relied on STI treatment in the past 12 months as a proxy. Second, the NSFG does not collect information on adherence to a respondent's primary contraceptive method. Some women who report using short-acting and coital-dependent methods may not use them consistently which may impact their condom use and, subsequently, the findings of this study. Third, my analyses relied on women's self-reported contraceptive use and could be subject to recall bias. However, the contraceptive calendar is a well-validated method, and analyses were limited to a 12-month recall period.²⁵ Fourth, this study does not include measures of intimate partner violence, sexual coercion, or sexual orientation which are associated with increased STI

risk and should be included in future research. Lastly, this study is unable to examine causality due to the cross-sectional nature of the data. However, this study contributes to the literature by using a nationally representative sample to assess predictors not only of dual method use, but STI treatment which previous studies have not done.

CONCLUSION

This study used nationally representative data to provide new evidence suggesting increased LARC use among young people is not associated with higher prevalence of STI treatment. Instead, findings suggest that relationship status, frequency of condom use, number of lifetime sexual partners, and race/ethnicity are more predictive of STI treatment than primary contraceptive method. Efforts to address the increasing STI burden should be directed at enabling young people, who have the highest STI rates and are more likely to rely on condoms as a primary method, to be able to access and consistently use condoms.

Table 1. Participant demographic characteristics^a

	N	Mean (se)/%
Age, mean (se)	3,687	20.7 (0.06)
Race/ethnicity, %		
Hispanic	963	22.3
Non-Hispanic white	1,635	53.4
Non-Hispanic Black	780	15.3
Non-Hispanic Other	309	9.0
Total family income, %		
< \$10,000	642	14.4
\$10,000 – \$29,999	1,254	31.1
\$30,000 - \$49,999	673	18.1
\$50,000 - \$99,999	775	25.0
\$100,000 or more	343	11.5
Age at first sex, mean (se)	3,687	16.3 (0.05)
Number of lifetime male partners, mean (se)	3,687	5.10 (0.12)
Number of sexual encounters in past 4 weeks, mean (se)	3,687	11.6 (2.29)
Primary method in past 12 months, % ^b		
LARC	460	12.1
Short-acting hormonal	1,426	42.4
Condoms	1,112	28.4
Coital-dependent	337	9.4
None	352	7.8
Relationship type(s) in past 12 months, %		
Serious only	193	5.3
Dating only	1,971	53.0
Casual only	967	26.5
Mix of serious, dating, and/or casual	556	15.3
Frequency of condom use in past 12 months, %		
None of the time	1,073	28.8
Some or half of the time	994	27.7
Most of the time	653	17.9
Every time	967	25.7
Treated for STI in past 12 months, %	3,687	8.6

^a Table 1 presents unweighted Ns and weighted means/%

^b Primary method used was categorized as LARC (IUD and contraceptive implants), short-acting hormonal method (oral contraceptive control pills, contraceptive patches, and rings), condoms, coital-dependent method (fertility awareness-based methods, sponges, diaphragms, withdrawal, female condoms, spermicide, emergency contraception, or other method), or no method.

N

3,687

Table 2. Predictors of STI treatment in past 12 months

	Model (1) OR/CI	Model (2) OR/CI	Model (3) OR/CI	Model (4) OR/CI
Primary method (<i>ref=condoms</i>) ^a				
LARC	1.41 [0.87 – 2.27]	1.41 [0.88 – 2.26]	1.45 [0.87 – 2.40]	1.43 [0.86 – 2.36]
Short-acting hormonal	1.32 [0.86 – 2.04]	1.34 [0.87 – 2.06]	1.31 [0.84 – 2.06]	1.32 [0.85 – 2.06]
Coital-dependent	1.55 [0.82 – 2.92]	1.57 [0.84 – 2.93]	1.44 [0.74 – 2.82]	1.44 [0.75 – 2.80]
None	1.28 [0.76 – 2.16]	1.42 [0.84 – 2.37]	1.30 [0.73 – 2.33]	1.39 [0.78 – 2.48]
Age				
	0.97 [0.92 – 1.03]	0.99 [0.93 – 1.05]	0.98 [0.93 – 1.04]	0.99 [0.93 – 1.05]
Race/ethnicity (<i>ref=non-Hispanic white</i>)				
Hispanic	1.20 [0.82 – 1.76]	1.23 [0.84 – 1.81]	1.19 [0.82 – 1.72]	1.21 [0.84 – 1.76]
Non-Hispanic Black	1.92*** [1.35 – 2.72]	1.88*** [1.33 – 2.65]	1.99*** [1.41 – 2.80]	1.94*** [1.38 – 2.73]
Non-Hispanic other	1.42 [0.81 – 2.51]	1.35 [0.77 – 2.37]	1.43 [0.82 – 2.51]	1.35 [0.77 – 2.38]
Total family income (<i>ref=<\$10,000</i>)				
\$10,000 – \$29,999	0.88 [0.58 – 1.34]	0.88 [0.58 – 1.35]	0.89 [0.59 – 1.35]	0.89 [0.59 – 1.35]
\$30,000 - \$49,999	0.98 [0.62 – 1.55]	0.97 [0.62 – 1.53]	0.98 [0.63 – 1.52]	0.96 [0.62 – 1.50]
\$50,000 - \$99,999	0.68 [0.42 – 1.09]	0.67 [0.42 – 1.07]	0.68 [0.42 – 1.09]	0.66 [0.41 – 1.07]

^a Primary method used was categorized as LARC (IUD and contraceptive implants), short-acting hormonal method (oral contraceptive control pills, contraceptive patches, and rings), condoms, coital-dependent method (fertility awareness-based methods, sponges, diaphragms, withdrawal, female condoms, spermicide, emergency contraception, or other method), or no method.

\$100,000 or more	0.74 [0.38 – 1.44]	0.74 [0.38 – 1.43]	0.72 [0.37 – 1.39]	0.72 [0.38 – 1.38]
Age at first sex	0.93 [0.86 – 1.00]	0.94 [0.86 – 1.02]	0.93* [0.86 – 1.00]	0.93 [0.86 – 1.00]
Number of lifetime sexual partners	1.06*** [1.03 – 1.08]	1.04** [1.01 – 1.07]	1.05*** [1.03 – 1.08]	1.04** [1.02 – 1.07]
Sexual frequency in past 4 weeks	1.00 [1.00 – 1.00]	1.00 [1.00 – 1.00]	1.00 [1.00 – 1.00]	1.00 [1.00 – 1.00]
Relationship status (<i>ref=serious-only</i>)				
Dating-only		1.82 [0.84 – 4.00]		1.80 [0.84 – 3.88]
Casual-only		2.39* [1.11 – 5.14]		2.26* [1.07 – 4.76]
Mix of serious, dating, and/or casual		3.78** [1.66 – 8.62]		3.25** [1.41 – 7.46]
Frequency of condom use (<i>ref=All of the time</i>)				
None of the time			0.94 [0.54 – 1.63]	0.95 [0.55 – 1.65]
Some or half of the time			2.09** [1.32 – 3.33]	1.94** [1.22 – 3.08]
Most of the time			1.41 [0.87 – 2.29]	1.30 [0.81 – 2.10]

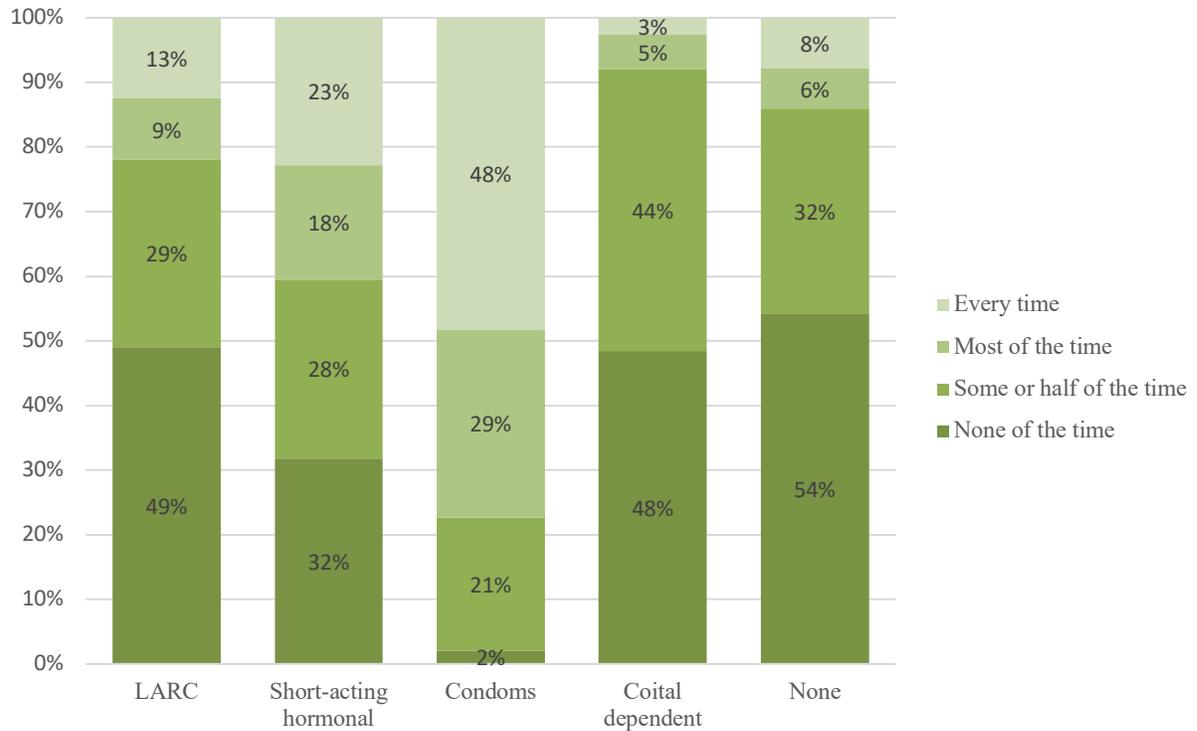
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3. Mediation effect of relationship status on frequency of condom use and STI treatment in past 12 months

	Frequency of condom use (<i>reference = None of the time</i>)								
	Some or half of the time			Most of the time			All of the time		
	Coef.	CI	% Explained	Coef.	CI	% Explained	Coef.	CI	% Explained
Total effect of frequency of condom use on STI treatment	0.73***	0.32-1.14		0.23	-0.29-0.76		-0.11	-0.61-0.39	
Indirect (mediating) effect of relationship status on STI treatment	0.07	0.00-0.15	9.59	0.08*	0.01-0.16	34.78	0.02	-0.05-0.08	-18.18
Remaining direct effect of frequency of condom use on STI treatment	0.66**	0.25-1.07	90.41	0.15	-0.38-0.68	65.22	-0.13	-0.63-0.38	118.18

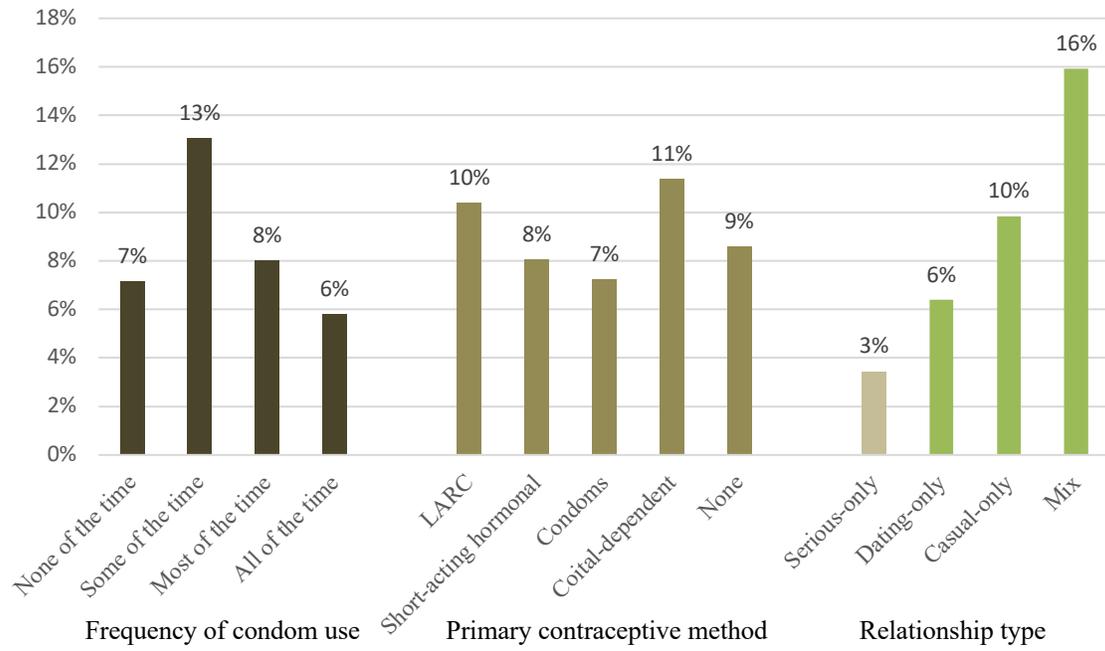
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1. Frequency of condom use in the past 12 months by primary contraceptive method used^a



^a Primary method used was categorized as LARC (IUD and contraceptive implants), short-acting hormonal method (oral contraceptive control pills, contraceptive patches, and rings), condoms, coital-dependent method (fertility awareness-based methods, sponges, diaphragms, withdrawal, female condoms, spermicide, emergency contraception, or other method), or no method.

Figure 2. STI treatment by frequency of condom use, primary contraceptive method used, and relationship status in past 12 months^a



^a Primary method used was categorized as LARC (IUD and contraceptive implants), short-acting hormonal method (oral contraceptive control pills, contraceptive patches, and rings), condoms, coital-dependent method (fertility awareness-based methods, sponges, diaphragms, withdrawal, female condoms, spermicide, emergency contraception, or other method), or no method.

Appendix A. Demographic characteristics of the main analytic sample and sensitivity analysis sub-sample of respondents who used the same method for 12 months

	Study sample	Consistent users (12 mo)	% diff	p-value
	mean/% (se)	mean/% (se)		
Age, mean (se)	20.7 (0.06)	21.4 (0.10)	0.7	<0.001
Race/ethnicity, %				
Hispanic	22.3	20.5	-1.8	0.012
Non-Hispanic white	53.4	58.9	5.5	<0.001
Non-Hispanic Black	15.3	13.3	-2	0.024
Non-Hispanic Other	9.0	7.3	-1.7	0.172
Total family income, %				
< \$10,000	14.4	14.2	-0.2	0.828
\$10,000 – \$29,999	31.1	27.1	-4.04	0.087
\$30,000 - \$49,999	18.1	21.9	3.77	0.033
\$50,000 - \$99,999	25	22.6	-2.42	0.696
\$100,000 or more	11.5	11.3	-0.17	0.768
Age at first sex, mean (se)	16.3 (0.05)	16.2 (0.93)	-0.1	0.714
Number of lifetime male partners, mean (se)	5.1 (0.12)	5.1 (0.27)	0.02	0.881
Number of sexual encounters in past 4 weeks, mean (se)	11.6 (2.29)	20.21 (7.60)	8.61	<0.001
Primary method in past 12 months, % ^a				
LARC	12.1	15.8	3.7	<0.001
Short-acting hormonal	42.4	51.5	9.1	<0.001
Condoms	28.4	21.8	-6.6	<0.001
Coital-dependent	9.4	6.5	-2.9	<0.001
None	7.8	4.5	-3.3	0.001
Frequency of condom use in past 12 months, %				
None of the time	28.8	43.0	14.2	<0.001
Some or half of the time	27.7	20.4	-7.3	<0.001

^a Primary method used was categorized as LARC (IUD and contraceptive implants), short-acting hormonal method (oral contraceptive control pills, contraceptive patches, and rings), condoms, coital-dependent method (fertility awareness-based methods, sponges, diaphragms, withdrawal, female condoms, spermicide, emergency contraception, or other method), or no method.

Most of the time	17.9	11.9	-6	<0.001
Every time	25.7	24.7	-1	0.024
Relationship type(s) in past 12 months, %				
Serious-only	5.3	5.0	-0.3	0.781
Dating-only	53.0	60.9	7.9	<0.001
Casual-only	26.5	24.8	-1.7	0.331
Mix of serious, dating, and/or casual	15.3	9.3	-6	<0.001
Treated for STI in past 12 months, %	8.6	7.1	-1.5	0.111
<i>N</i>	3,687	943		

Appendix B. Predictors of STI treatment in past 12 months among consistent contraceptive users

	Model (1) OR/CI	Model (2) OR/CI	Model (3) OR/CI	Model (4) OR/CI
Primary method (<i>ref=condoms</i>) ^a				
LARC	2.25 [0.70 – 7.20]	2.35 [0.80 – 6.89]	1.50 [0.52 – 4.35]	1.62 [0.59 – 4.42]
Short-acting hormonal	2.04 [0.72 – 5.80]	2.17 [0.86 – 5.49]	1.33 [0.48 – 3.68]	1.43 [0.55 – 3.69]
Coital-dependent	1.16 [0.19 – 7.03]	1.20 [0.21 – 6.91]	0.74 [0.12 – 4.53]	0.80 [0.14 – 4.43]
None	1.78 [0.49 – 6.43]	1.88 [0.56 – 6.33]	1.17 [0.26 – 5.23]	1.25 [0.29 – 5.36]
Age				
	0.96 [0.90 – 1.01]	0.99 [0.86 – 1.14]	0.95 [0.82 – 1.09]	0.96 [0.83 – 1.11]
Race/ethnicity (<i>ref=non-Hispanic white</i>)				
Hispanic	1.27 [0.61 – 2.65]	1.28 [0.60 – 2.73]	1.39 [0.67 – 2.86]	1.32 [0.61 – 2.85]
Non-Hispanic Black	2.16* [1.01 – 4.61]	2.23* [1.07 – 4.68]	2.58** [1.26 – 5.29]	2.55* [1.24 – 5.27]
Non-Hispanic other	4.50* [1.40 – 14.49]	4.92* [1.46 – 16.64]	4.99** [1.64 – 15.11]	4.95** [1.65 – 14.81]
Total family income (<i>ref=<\$10,000</i>)				
\$10,000 – \$29,999	0.37* [0.17 – 0.82]	0.37* [0.16 – 0.85]	0.35* [0.16 – 0.78]	0.34* [0.15 – 0.78]
\$30,000 - \$49,999	0.51 [0.18 – 1.44]	0.53 [0.20 – 1.40]	0.52 [0.20 – 1.33]	0.53 [0.22 – 1.31]
\$50,000 - \$99,999	0.49	0.49	0.53	0.51

^a Primary method used was categorized as LARC (IUD and contraceptive implants), short-acting hormonal method (oral contraceptive control pills, contraceptive patches, and rings), condoms, coital-dependent method (fertility awareness-based methods, sponges, diaphragms, withdrawal, female condoms, spermicide, emergency contraception, or other method), or no method.

	[0.19 – 1.23]	[0.20 – 1.23]	[0.21 – 1.31]	[0.21 – 1.27]
\$100,000 or more	1.09 [0.33 – 3.54]	1.23 [0.36 – 4.20]	1.17 [0.37 – 3.68]	1.26 [0.39 – 4.14]
Age at first sex	0.92 [0.74 – 1.14]	0.94 [0.77 – 1.15]	0.94 [0.77 – 1.34]	0.96 [0.80 – 1.16]
Number of lifetime male sexual partners	1.05* [1.01 – 1.09]	1.03 [0.99 – 1.07]	1.05** [1.01 – 1.09]	1.04* [1.00 – 1.08]
Number of sexual encounters in past 4 weeks	0.96 [0.90 – 1.01]	0.95 [0.90 – 1.07]	0.94* [0.89 – 1.00]	0.94* [0.88 – 0.99]
Relationship status (<i>ref=serious-only</i>)				
Dating-only		1.58 [.018 – 14.03]		1.40 [0.20 – 9.95]
Casual-only		2.31 [0.30 – 18.07]		1.87 [0.30 – 11.61]
Mix of serious, dating, and/or casual		4.16 [0.42 – 40.94]		2.83 [0.36 – 22.28]
Frequency of condom use (<i>ref=All of the time</i>)				
None of the time			3.12 [0.95 – 10.23]	2.86 [0.90 – 9.06]
Some or half of the time			6.10** [2.18 – 17.04]	5.31** [1.90 – 14.80]
Most of the time			2.27 [0.76 – 6.80]	1.95 [0.64 – 5.97]

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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