

Factors Associated with Contraceptive Use and Nonuse, United States, 2004

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CONTEXT: Each year, nearly one in four U.S. women at risk of unintended pregnancy experience one or more months of contraceptive nonuse. Understanding what factors are associated with risky contraceptive use patterns can inform programs and policies designed to reduce levels of unintended pregnancy.

METHODS: A nationally representative sample of 1,978 adult women at risk for unintended pregnancy was surveyed over the telephone in 2004. Respondents provided information on contraceptive use over the past 12 months. Multiple logistic regressions were used to identify factors associated with different contraceptive use patterns.

RESULTS: Ambivalence about avoiding pregnancy was strongly associated with both contraceptive nonuse and having a gap in use while remaining at risk of unintended pregnancy (odds ratios, 2.4 and 2.0, respectively). Other significant predictors of either of these risky contraceptive behaviors were having less than a college education, being black, being 35–44 years old, having infrequent sexual intercourse, not being in a current relationship, being dissatisfied with one's method and believing that contraceptive service providers were not available to answer method-related questions (1.7–3.8).

CONCLUSIONS: Providers could better help women avoid unintended pregnancy by initiating regular assessments of method use difficulties, improving counseling on method choice and pregnancy risk, and identifying and assisting women at higher risk for inconsistent method use because of disadvantage, relationship characteristics or ambivalence about pregnancy prevention. In addition to providers' efforts, broader societal commitment is critical for increasing contraceptive knowledge and expanding access to contraceptive care for all women who are at risk of having an unintended pregnancy.

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Women are exposed to the risk of unintended pregnancy over much of their adult lives. Even though continuous, correct use of contraceptives during all periods of risk can greatly reduce the likelihood of unintended pregnancy, many women have difficulty adhering to such a regimen over a long period. In fact, a national survey of non-sterilized women at risk for unintended pregnancy found that one in six were not currently using contraceptives, and one in four had had unprotected sex during one or more of the previous 12 months.¹ Not surprisingly, levels of unintended pregnancy are higher among women who are long-term nonusers or who experience gaps in method use than among continuous users.²

Programs and policy designed to reduce the unacceptably high levels of unintended pregnancy in the United States could be strengthened by a better understanding of why some women have difficulty using contraceptives continuously even when they do not want to become pregnant. One way to improve such understanding of risky contraceptive behavior is to examine the relationship between patterns of contraceptive use over time and a broad set of factors—including women's attitudes toward pregnancy prevention; attitudes toward and experiences with contraceptive methods and service pro-

viders; and demographic, socioeconomic and sexual partnership characteristics.

A variety of studies have focused on individual factors or types of factors, confirming the association between contraceptive behavior and key characteristics of women, but few have considered multiple types of factors simultaneously. For example, women of low socioeconomic status typically have lower rates of contraceptive use and higher rates of contraceptive failure and unintended pregnancy than women of higher socioeconomic status.^{3–5} These associations have spurred continued efforts to provide publicly funded family planning services to low-income women. Consequently, wide differences in contraceptive nonuse according to poverty status and race or ethnicity narrowed dramatically: Between 1982 and 1995, overall levels of nonuse among poor and minority women at risk for unintended pregnancy declined considerably, approaching the levels found among more affluent women and white women, respectively.⁶ However, differences persist, and at the national level, contraceptive nonuse increased between 1995 and 2002;⁷ moreover, this rise in nonuse occurred disproportionately among low-income and minority women. The underlying forces fueling socioeconomic disparities in

contraceptive use are complicated and not fully understood. While differential access to information and uninterrupted, quality health care are likely important, other factors, including women's attitudes and motivations, may be associated with both socioeconomic status and contraceptive use patterns.

The relationship between women's attitudes regarding contraception and pregnancy prevention and their contraceptive behavior has also been investigated, and several theoretical models have been developed to explain these associations.⁸⁻¹¹ In addition, some empirical studies have addressed these issues. They typically measure the strength of women's motivation to avoid pregnancy—such as their reaction to the hypothetical situation of discovering they were pregnant,^{12,13} their agreement with statements suggesting a fatalistic attitude toward becoming pregnant,¹⁴ whether and when they desire to have a child, and their attitudes toward conception with a specific partner.¹⁵ In general, women with ambivalent attitudes toward pregnancy have been found to use contraceptives less continuously and less effectively than those with a clearly defined, firm motivation to avoid pregnancy.^{14,16,17}

A related body of research has investigated women's method switching and discontinuation. Early discontinuation of a method has been associated with both difficulties using the method and side effects experienced while using it.¹⁸⁻²⁰ In addition, a clear link between satisfaction with one's health care provider and method satisfaction has been documented.¹⁸ In one small study, women who reported they would be happy if a pregnancy occurred were more likely to discontinue the pill before the second pack than were women who reported they would be unhappy if they became pregnant.²¹

Method switchers are potentially at higher risk of unintended pregnancy than women who use the same method all year, largely because of problems in adjusting to a new method or restarting use after a period of nonuse. This expectation of increased risk is supported by the higher failure rates experienced by women in the first six months of using a method compared with rates among longer-term users.^{4,5}

Evidence that some pregnancies resulting from contraceptive failures are actually "intended" has led to a lively discussion highlighting the need to measure multiple dimensions of pregnancy intendedness and positing hypotheses about the role of ambivalence about both pregnancy and contraception in predicting contraceptive behavior and pregnancy outcomes.²²⁻²⁸ One study concluded that "ambivalence about avoiding pregnancy. . . is likely to be associated with imperfect use of contraceptives and the consequently higher risk of pregnancy during typical use."^{22(p. 247)}

This article builds on earlier analyses that developed a new typology of the pattern of contraceptive use over a one-year period, grouping women into five categories that reflect level of risk for unintended pregnancy.¹ The

present analyses focus on women who are at increased risk of unintended pregnancy—those who did not use a method all year, those who had a period of nonuse during which they were at risk of pregnancy, and those who switched methods or who stopped or started a method during the year. Our primary aim is to explore the relationship between a broad range of possible predictors and women's experience with risky contraceptive use patterns over a one-year period. We begin by assessing the strength of the relationship between method use patterns and demographic, socioeconomic and sexual partnership characteristics; we then control for these variables and examine the association between pattern of contraceptive use and women's attitudes toward avoiding pregnancy and their experiences with methods and with contraceptive service providers.

METHODS

Data Collection

In early 2004, we conducted telephone interviews with a nationally representative sample of 1,978 women who were aged 18-44 and at risk for unintended pregnancy. Women were defined as being at risk if they reported having had sexual intercourse with a man in the past year, they were not pregnant or were not two or fewer months postpartum, they were not trying to get pregnant and neither they nor their partner were contraceptively or noncontraceptively sterile.* Eligible respondents were identified by screening households that had been selected using a list-assisted, random digit dial sample of telephone numbers; interviews averaged 30 minutes. Women were asked to provide detailed information on a range of topics, including demographic and socioeconomic characteristics, sexual partnership and partner characteristics, attitudes toward pregnancy and birth control, and experiences with contraceptive methods and with service providers. Among the 2,670 eligible women identified during screening, 2,000 completed the interview, for a completion rate of 75%. After factoring in the completion rates achieved in screening households (60%) and among age-eligible women (95%), we estimated that the net response rate was 43%. During data cleaning, we identified 22 respondents who had not reported during the screening that they were contraceptively or noncontraceptively sterile, but did so in the interview; they were excluded from all analyses.

Sampling error and differential response rates resulted in some population subgroups' being overrepresented or underrepresented in the final data set. After comparing the distribution of women in our sample with distributions

*Sterilized women were excluded because they are no longer at risk for unintended pregnancy and their ongoing use of contraception cannot be modeled in the same manner as that of women who may choose to start, stop or continue a method. Women who had undergone sterilization in the past year could have been included, but the difficulty of screening for this characteristic was not justified, given the few women who might have been identified.

of women at risk for unintended pregnancy (selected using the same eligibility criteria) in the 2002 National Survey of Family Growth (NSFG), a nationally representative survey of women of reproductive age, we constructed weights so that our sample matched the NSFG distribution of women according to age, marital status, and race or ethnicity. (In the original, unweighted distribution, women in our sample were somewhat older and more likely to be married or Hispanic than women in the NSFG sample.) The weights reduced some of the possible biases from nonresponse and underrepresentation of subgroups who were less likely to have completed the interview. However, other biases may remain because of our inability to interview women who did not have telephones (who are likely to be poor), women who were never at home and those who refused to be interviewed. Additional sampling and fieldwork details have been described elsewhere.¹

Variable Construction

Using a series of questions about women's contraceptive method use during the prior 12 months and whether women were sexually active or pregnant during periods of nonuse, we created a typology that classifies respondents into five groups: continuous users with no method switches, continuous users with one or more method switches, noncontinuous users with gaps in use when they were not at risk for unintended pregnancy, noncontinuous users with gaps in use when they were at risk for unintended pregnancy and nonusers for the entire past 12 months. Gaps in use were defined as a period of a month or more when no method was used. Women were considered at risk for unintended pregnancy during the gap if they reported that they had engaged in sexual intercourse at least once during that period and were not pregnant.

The following demographic and socioeconomic characteristics were measured: age (18–24, 25–34, 35–44); race or ethnicity (non-Hispanic white, Asian or other, Hispanic, non-Hispanic black); parity (zero, one, or two or more); education (less than high school, complete high school or GED, some college, or complete college or more); poverty status, as a percentage of the federal poverty level (less than 100%, 100–249%, or 250% or more); and health insurance coverage during the last year (private, Medicaid, or none or do not know).

The measures of women's sexual partnerships were marital status (currently married, currently cohabiting, formerly married and not cohabiting, never-married and not cohabiting), duration of current relationship (no current relationship, less than six months, 6–23 months, 2–4 years, or four years or more), frequency of sexual intercourse in the last three months (once

a month or less, 2–4 times a month, two or more times a week), number of sexual partners in the last year (one or more) and whether the woman believed her current partner had had multiple partners during the last year, at or around the same time that he was sexually involved with her.

Three measures of women's attitudes toward avoiding pregnancy were included. The first asked, "Thinking about your life right now, how important is it to you to avoid becoming pregnant?" Possible responses were "very important," "somewhat important," "a little important" and "not at all important." The second asked, "If you found out today that you were pregnant, would you feel very upset, a little upset, a little pleased or very pleased?" Finally, women were asked if they agreed or disagreed with the statement "It doesn't matter whether I use birth control or not; when it is my time to get pregnant, it will happen." For the last two questions, 5% and 2% of women, respectively, volunteered that they were neutral or in the middle, and were unable to choose from among our response categories. In the multivariate analyses, we kept women who were ambivalent (i.e., women who were at risk for unintended pregnancy but who would be pleased by a pregnancy) or fatalistic about getting pregnant separate, and grouped neutral women with those who would be upset about a pregnancy or who disagreed with the fatalistic statement about pregnancy and birth control. These variables measure attitudes at the time of the survey; attitudes may have been different during the period of contraceptive use being investigated. However, for many women, the attitudes expressed here likely mirror their attitudes in general throughout the year and may reflect more long-standing beliefs.

We included two method-related variables. One measured the type of method women were using at the start of the past year; we categorized methods as either hormonal or long-acting (pill, injectable, IUD, implant, patch, ring) or barrier or traditional (condoms, diaphragm, spermicide, withdrawal, natural family planning). The second measured women's satisfaction with their current method (if they were using one) or the method they had most recently discontinued (if they were not currently using one).^{*} Additional variables that measured method problems or side effects were obtained, but they could not be used in an analysis of factors associated with nonuse or gaps in use because they were asked only of women who were currently using a method.

Several explanatory variables related to service providers were also analyzed: a variable measuring whether and where a woman had made a contraceptive or reproductive health visit in the past two years (private doctor, clinic, other), and three measures of the quality of women's interactions with providers. These measures were based on a factor analysis of seven items that asked women to rate, using a five-point Likert scale, how strongly they agreed or disagreed with statements about specific aspects of the care they received at their most

^{*}The exact wording was "Overall, are you now satisfied or dissatisfied with (current method)?" and "Overall, were you satisfied or dissatisfied with your use of (past method)?"

recent visit.* In the factor analysis, five items loaded together on the same factor, while two separated out into their own factors. We summed the scores of the five items that loaded together to create a composite measure of satisfaction (categorized as low, medium or high satisfaction); the other two items assessed whether the woman reported usually seeing the same doctor or clinician at each visit and whether she felt she could call her provider with contraceptive questions.

Women who had not visited a provider recently were asked why they had not made a visit in the prior two years. Those who reported that having "had unpleasant experiences getting these services in the past" was a very important reason for not making a visit were grouped with women scoring low on the provider satisfaction composite variable; those reporting that this was a somewhat important reason were grouped with women scored as having a medium level of provider satisfaction; and those reporting that this was not a reason for not seeing a provider were grouped with women having a high level of provider satisfaction. Again, these questions referred to women's last reproductive health care visit, and that visit may or may not have preceded some contraceptive use patterns (such as a gap in use).

Analysis

We first examined the bivariate relationship between each set of factors and women's method use patterns. These associations were tested using two-tailed t tests with significance of .05 for comparisons among subgroups. Tests were adjusted for multiple comparisons using the Bonferroni correction factor.

For the multivariate analyses, we examined three models. The first includes all women in the sample and compares nonusers for the entire year with all other women. The second model includes only women who used a method in the prior year and compares those who had a period of unprotected risk with those who had no such period. The final model includes only women who used a method in the prior year and experienced no at-risk gap; this model compares women who switched methods or who stopped or started a method† with women who continuously used the same method combination throughout the year.

We performed binary logistic regression for each model using three sets of predictors. First, we entered

*The seven statements were "The people who work there make an effort to find out my needs"; "The health care I receive there is of good quality"; "The rooms and equipment are all clean"; "The staff who work there treat me with respect"; "Getting service there is orderly and pleasant"; "I usually see the same doctor or clinician every time I go there"; and "If I have questions about my contraceptive method, I know I can call the office and talk to someone."

†This subgroup includes women who switched their method or combination of methods without any gap in use, and those who stopped or started a method before or after a pregnancy or a period of sexual inactivity.

TABLE 1. Percentage distribution of women aged 18–44 at risk for unintended pregnancy, by pattern of contraceptive method use in the past year, according to demographic, socioeconomic and partnership characteristics, United States, 2004

Characteristic	N	Same method	Method switch	Gap in use, not at risk	Gap in use, at risk	No method	Total
All	1,978	37.7	24.1	15.3	14.9	8.1	100.0
DEMOGRAPHIC							
Age							
18–24	490	28.7	30.9	18.3	16.4	5.7	100.0
25–34	850	38.1†	24.7†	15.5	15.8	5.8	100.0
35–44	638	47.2†,‡	15.7†,‡	11.6†	11.8	13.7†,‡	100.0
Race/ethnicity							
White	1,265	40.3	25.1	15.2	13.4	6.0	100.0
Hispanic	348	34.3	19.9	15.0	18.2	12.6†	100.0
Black	227	26.5†	25.7	18.3	17.9	11.7†	100.0
Asian/other	132	42.6§	19.1	11.3	15.7	11.3	100.0
Parity							
0	659	35.2	30.5	14.1	13.8	6.5	100.0
1	479	30.9	23.4	18.7	18.9	8.2	100.0
≥2	840	44.6†,‡	18.0†,‡	14.4	13.4‡	9.7	100.0
SOCIOECONOMIC							
Education							
<H.S.	190	30.3	21.7	12.6	17.7	17.7	100.0
H.S./GED	414	33.9	24.4	11.4	20.1	10.2	100.0
Some college	668	34.3	24.2	18.1‡	15.7	7.7†	100.0
≥college	702	45.5†,‡,§	24.4	15.4	10.1†,‡,§	4.7†,‡	100.0
% of federal poverty level							
<100	264	25.6	25.6	20.5	16.7	11.6	100.0
100–249	529	36.2†	22.5	14.7	18.8	7.8	100.0
≥250	987	41.9†	23.9	15.0	12.1‡	7.1	100.0
Don't know/refused	198	39.4†	26.8	10.6†	15.2	8.1	100.0
Insurance coverage							
Private	1,373	40.9	25.9	14.1	12.4	6.7	100.0
Medicaid	327	25.3†	21.9	19.7†	23.9†	9.2	100.0
None/don't know	276	38.4‡	18.3†	15.5	14.8‡	13.0†	100.0
SEXUAL PARTNERSHIP							
Marital status							
Married	1,207	46.2	19.8	12.0	12.8	9.2	100.0
Cohabiting	277	32.4†	29.2†	12.7	18.8†	6.9	100.0
Formerly married††	109	33.8†	20.0	14.6	20.0	11.5	100.0
Never-married††	383	27.1†	29.0†	23.1†,‡	14.6	6.2	100.0
Duration of current relationship							
>4 yrs.	1,225	47.0	19.3	10.9	13.8	9.0	100.0
2–4 yrs.	273	39.8	31.3†	12.8	11.5	4.6	100.0
6–23 mos.	157	27.9†	39.6†	13.2	13.7	5.6	100.0
<6 mos.	94	22.6†,‡	29.8	22.6†	18.5	6.5	100.0
No relationship	229	15.2†,‡,§	21.3§	31.4†,‡,§	21.3†,‡	10.8	100.0
Frequency of intercourse in last 3 mos.							
≤once a month	331	23.0	17.1	30.2	17.1	12.6	100.0
2–4 times a month	769	46.0†	23.9†	12.5†	11.8	5.8†	100.0
≥2 times a week	841	37.0†,‡	27.8†	11.1†	16.4‡	7.6†	100.0
No. of sexual partners in last year							
1	1,752	40.2	23.1	14.5	13.5	8.8	100.0
≥2	226	23.8†	29.9†	19.5†	22.8†	4.0†	100.0
Believe current partner is monogamous							
Yes/no partner	1,841	39.2	24.5	14.4	13.5	8.5	100.0
No	137	22.0†	20.2	24.4†	29.8†	3.6†	100.0

†Significantly different from percentage in the first row at p<.05. ‡Significantly different from percentage in the second row at p<.05. §Significantly different from percentage in the third row at p<.05. ††Not cohabiting. Note: Ns are unweighted.

TABLE 2. Percentage distribution of women aged 18–44 at risk for unintended pregnancy, by pattern of contraceptive method use in the past year, according to attitudinal, method-related and provider-related characteristics

Characteristic	N	Same method	Method switch	Gap in use, not at risk	Gap in use, at risk	No method	Total
ATTITUDES							
Importance of avoiding pregnancy							
Very important	1,149	38.9	26.7	16.6	12.3	5.6	100.0
Somewhat important	418	38.8	25.3	12.5	16.8	6.6	100.0
A little/not important	399	33.1	14.4†,‡	13.8	21.5†	17.1†,‡	100.0
Reaction to becoming pregnant							
Very upset	401	38.0	26.7	16.5	12.8	6.1	100.0
A little upset	563	37.3	28.9	16.6	12.8	4.3	100.0
Neutral	100	36.8	17.9	17.9	18.9	8.4	100.0
A little pleased	444	38.8	25.2	15.2	13.3	7.4	100.0
Very pleased	470	37.2	14.9†,‡,§	11.3	20.6†,‡	16.1†,‡,§	100.0
Fatalistic attitude toward pregnancy and birth control							
Disagree/neutral	1,319	40.2	26.3	15.5	12.9	5.2	100.0
Agree	659	32.4†	19.6†	14.6	19.2†	14.3†	100.0
METHOD-RELATED							
Type at start of year††							
Hormonal/long-acting	995	41.6	35.1	11.5	11.8	na	100.0
Barrier/traditional	735	44.4	16.2†	18.3†	21.1†	na	100.0
None	248	na	na	22.4†	9.1‡	68.5	100.0
Satisfaction with method in past year							
Very satisfied	1,043	50.4	23.7	13.8	12.2	na	100.0
Somewhat satisfied	528	34.8†	29.2	18.0	18.0†	na	100.0
Neutral/dissatisfied	235	13.5†,‡	30.8	26.2†,‡	29.5†,‡	na	100.0
No method	168	na	na	na	na	100.0	100.0
PROVIDER-RELATED							
Type of provider							
Private doctor	1,241	41.0	23.6	15.2	14.5	5.7	100.0
Clinic	528	31.2†	30.1†	14.3	17.2	7.2	100.0
None/don't know	209	35.8	10.8†,‡	17.9	11.3	24.1†,‡	100.0
Provider satisfaction							
High	1,257	38.3	23.6	15.2	14.5	8.5	100.0
Medium	572	38.2	25.0	14.7	15.4	6.8	100.0
Low	149	30.8	25.3	17.8	16.4	9.6	100.0
Usually see same clinician							
Yes	1,450	38.9	25.8	14.1	14.9	6.4	100.0
No	337	33.2	26.1	17.6	17.0	6.0	100.0
No provider	191	37.1	8.6†,‡	19.3	10.7	24.4†,‡	100.0
Can call provider with questions							
Yes	1,678	38.0	26.7	14.8	14.8	5.8	100.0
No	109	34.3	11.8†	15.7	25.5†	12.7†	100.0
No provider	191	37.1	8.6†	19.3	10.7‡	24.4†	100.0

†Significantly different from percentage in the first row at p<.05. ‡Significantly different from percentage in the second row at p<.05. §Significantly different from percentage in the fourth row at p<.05. ††Hormonal/long-acting methods are the pill, injectable, IUD, implant, patch and ring. Barrier/traditional methods are condoms, diaphragm, spermicide, withdrawal and natural family planning. Notes: Ns are unweighted. na = not applicable.

only the demographic, socioeconomic and sexual partnership variables; second, we entered only the attitudinal, method-related and provider-related variables; and third, we entered all predictors. Analyses were conducted using SPSS version 13. Several models were tested by excluding or including variables on the basis of the bivariate results and stepwise regression analysis; however, altering the models in this way did not appreciably change the results for those variables found

to be significant in each model. In addition, to assess if multicollinearity was affecting our results, particularly related to poverty, education, insurance and race, we tested models by including and excluding these variables. Poverty was not significant in any of the models, with or without the other variables that we suspected might be capturing dimensions of disadvantage, but because of its importance as a control variable, we retained it in all of our models. Finally, there were few differences between the partial and full models in the size or significance level of predictors; therefore we present only the findings from the full models.

RESULTS

Nearly four in 10 women surveyed used the same contraceptive method or combination of methods throughout the previous year with no switching and no gaps (Table 1, page 93). Another four in 10 women stopped or started method use during the year, although they did use a method during every month when they were at risk for unintended pregnancy: Twenty-four percent switched methods or switched between single and dual method use, and 15% switched in and out of method use because of a pregnancy or a period of sexual inactivity. The rest of the women experienced a period of contraceptive nonuse of at least one month while remaining at risk for unintended pregnancy: Fifteen percent had a gap of 1–11 months (average, five months), while 8% were nonusers for the entire year. These women exhibited the most risky contraceptive use behavior and were at high risk for unintended pregnancy.

Bivariate Findings

•*Background characteristics.* In all subgroups, some women experienced periods of unprotected risk during the past year, but the proportions varied by subgroup and by type of gap. Higher proportions of the oldest women, Hispanic and black women, and the least educated women than of younger, white and college-educated women, respectively, were nonusers all year. Also, a higher proportion of women who had not completed college than of those who had done so experienced at-risk gaps in method use. Compared with women who had private insurance, a higher proportion of those on Medicaid experienced an at-risk gap of less than a year, and a higher proportion of those who were uninsured were nonusers all year.

Infrequent sexual intercourse (once a month or less) was associated with a relatively high rate of nonuse all year and a relatively low rate of continuous use of one or more methods. Finally, having had two or more sexual partners in the past year and believing that a partner was not monogamous were associated with having had an at-risk gap, while these variables were associated with relatively low rates of nonuse all year.

•*Personal characteristics and experiences.* Among women who responded that avoiding pregnancy was very

important, fewer than one in five had any period of unprotected risk in the prior year (6% used no method, and 12% had an at-risk gap—Table 2). In comparison, among women who said that avoiding pregnancy was a little or not important, nearly four in 10 had a period of unprotected risk (17% used no method, and 22% had an at-risk gap). Similarly, higher proportions of women who responded that they would be very pleased with a pregnancy now than of those reporting other reactions were nonusers all year or experienced at-risk gaps. Furthermore, a higher proportion of women who agreed with the fatalistic statement about getting pregnant than of women who disagreed or were neutral reported a period of unprotected risk in the prior year or nonuse throughout the year.

A higher proportion of women who began the year using a traditional or barrier method than of those who began the year using a hormonal or long-acting method had an at-risk gap (21% vs. 12%). In addition, 30% of those who were neutral about or dissatisfied with their method experienced an at-risk gap during the year, whereas only 12–18% of those who were somewhat or very satisfied had such a gap.

Although there were no significant differences in the proportions of women experiencing gaps in method use between those who went to private providers and those who went to clinics in the past two years, a higher proportion of clinic clients reported method switching (30% vs. 24%). Not surprisingly, a higher proportion of women who made no visit for reproductive services than of women who visited either type of provider were nonusers for the entire year (24% vs. 6–7%).

Somewhat surprising was the lack of any association between women's contraceptive use patterns and their overall satisfaction with recent family planning or reproductive health services. However, one aspect of the provider-client relationship did have a significant association with method use patterns—higher proportions of women who felt that they could not call their clinician with questions about contraceptive methods than of those who felt otherwise had an at-risk gap or used no method all year.

Multivariate Findings

•*No method use versus any use.* As suggested by the bivariate results, women who were aged 35–44, were black or had less than a college education had elevated odds of having been nonusers for the entire year (odds ratios, 1.9–3.8—Table 3). In addition, the likelihood of nonuse was higher among women not currently in a relationship than among those in a relationship of more than four years' duration (2.4), and higher among women who reported having sexual intercourse no more than once a month than among those having sex two or more times a week (2.0). In contrast, women who had multiple partners in the past year were significantly less likely to be nonusers than were those who had one partner (0.3).

TABLE 3. Odds ratios from logistic regression analyses examining the association between demographic, socioeconomic and partnership characteristics and women's likelihood of having different patterns of contraceptive method use in the past year

Characteristic	Nonuse vs. any use (N=1,917)	At-risk gap vs. no at-risk gap (N=1,760)	Switching vs. continuous use† (N=1,482)
DEMOGRAPHIC			
Age			
18–24 (ref)	1.00	1.00	1.00
25–34	1.03	1.10	0.83
35–44	3.25***	0.97	0.51***
Race/ethnicity			
White (ref)	1.00	1.00	1.00
Hispanic	1.18	1.21	1.09
Black	1.94*	1.06	1.13
Asian/other	1.94	0.99	0.78
Parity			
0 (ref)	1.00	1.00	1.00
1	0.76	1.00	1.82***
≥2	0.87	0.76	1.23
SOCIOECONOMIC			
Education			
<H.S.	3.81***	1.94*	0.86
H.S./GED	1.98*	2.29***	1.11
Some college	1.99*	1.74**	1.02
≥college (ref)	1.00	1.00	1.00
% of federal poverty level			
<100 (ref)	1.00	1.00	1.00
100–249	0.59	1.52	0.75
≥250	0.93	1.27	0.94
Don't know/refused	0.67	1.09	0.77
Insurance coverage			
Private (ref)	1.00	1.00	1.00
Medicaid	1.18	2.01***	1.07
None/don't know	1.28	1.19	0.64*
SEXUAL PARTNERSHIP			
Marital status			
Married (ref)	1.00	1.00	1.00
Cohabiting	1.09	1.56*	1.10
Formerly married‡	1.05	0.92	0.44**
Never-married‡	0.65	0.80	0.81
Duration of current relationship			
>4 yrs. (ref)	1.00	1.00	1.00
2–4 yrs.	0.72	0.60*	1.60*
6–23 mos.	1.23	0.55*	2.84***
<6 mos.	1.83	1.08	3.37***
No relationship	2.38*	1.89*	7.23***
Frequency of intercourse in last 3 mos.			
≤once a month	1.97*	0.85	1.22
2–4 times a month	0.97	0.68*	0.82
≥2 times a week (ref)	1.00	1.00	1.00
No. of sexual partners in last year			
1 (ref)	1.00	1.00	1.00
≥2	0.34**	1.41	1.01
Believe current partner is monogamous			
Yes/no partner (ref)	1.00	1.00	1.00
No	0.43	1.85**	1.06

*p<.05. **p<.01. ***p<.001. †For an explanation of the "switching" subgroup, see second footnote on page 93. ‡Not cohabiting. Notes: Regressions include all variables listed in Table 4. Ns are unweighted. ref=reference group.

TABLE 4. Odds ratios from logistic regression analyses examining the association between attitudinal, method-related and provider-related characteristics and women's likelihood of having different patterns of contraceptive method use in the past year

Characteristic	Nonuse vs. any use	At-risk gap vs. no at-risk gap	Switching vs. continuous use†
ATTITUDES			
Importance of avoiding pregnancy			
Very important (ref)	1.00	1.00	1.00
Somewhat important	1.25	1.50*	1.18
A little/not important	2.42***	1.97**	1.04
Reaction to becoming pregnant			
Upset/neutral (ref)	1.00	1.00	1.00
A little pleased	1.61	0.91	0.96
Very pleased	2.42***	1.60*	0.72
Fatalistic attitude toward pregnancy and birth control			
Disagree/neutral (ref)	1.00	1.00	1.00
Agree	2.09***	1.37*	1.13
METHOD-RELATED			
Type at start of year			
Hormonal/long-acting (ref)	na	1.00	1.00
Barrier/traditional	na	1.81***	0.84
None	na	2.92***	na
Satisfaction with method in past year			
Very satisfied (ref)	na	1.00	1.00
Somewhat satisfied	na	1.65**	1.97***
Neutral/dissatisfied	na	3.42***	6.81***
PROVIDER-RELATED			
Type of provider			
Private doctor (ref)	1.00	1.00	1.00
Clinic	1.30	0.88	1.28
None/don't know	4.53***	0.54*	0.71
Provider satisfaction			
High (ref)	1.00	1.00	1.00
Medium	0.94	0.93	0.94
Low	1.02	0.67	1.47
Usually see same clinician			
Yes/no provider (ref)	1.00	1.00	1.00
No	0.89	0.97	0.93
Can call provider with questions			
Yes/no provider (ref)	1.00	1.00	1.00
No	3.07**	2.84***	0.83
<i>R</i> ² (Nagelkerke)			
for full model	0.275	0.213	0.248

*p<.05. **p<.01. ***p<.001. †For an explanation of the "switching" subgroup, see second footnote on page 93. Notes: Regressions include all variables listed in Table 3. ref=reference group. na=not applicable.

As expected, all three variables measuring women's attitudes toward avoiding pregnancy were highly significant. Women who said avoiding pregnancy was a little or not important had higher odds of having been nonusers all year than those who said avoiding pregnancy was very important (odds ratio, 2.4—Table 4). Similarly, women who reported that they would be very pleased if they found out they were pregnant were more likely to have been nonusers all year than were those who said they would be upset or neutral about getting pregnant (2.4), and women who agreed with the fatalistic statement

about pregnancy and use of birth control were more likely to have been nonusers than were those who disagreed or were neutral (2.1).

Only two provider-related variables were significant. Women who had made no contraceptive or reproductive health visit had elevated odds of having been nonusers all year (odds ratio, 4.5), as did women who felt they could not call their providers with contraceptive use questions (3.1).

•*At-risk gap versus no at-risk gap among users.* Most of the key demographic and socioeconomic variables were not significant in this model (Table 3). Education, however, remained significant; women who had less than a college education had higher odds of having experienced an at-risk gap than college-educated women (odds ratios, 1.7–2.3). Insurance coverage was also a significant predictor: Women on Medicaid were more likely than those who had private insurance to have had an at-risk gap (2.0). Four variables related to sexual partnership were significant. Cohabiting women and those who were not currently in a relationship had higher odds of having had an at-risk gap than married women and those in a relationship of more than four years (1.6 and 1.9, respectively); women who believed their current partner was not monogamous had higher odds than those who believed otherwise (1.9). Women in relationships of medium duration (between six months and four years) and those who reported having sex 2–4 times a month were less likely to have had an at-risk gap than were women in longer relationships and those who had sex two or more times a week, respectively (0.6–0.7).

Women's attitudes toward and motivation to avoid pregnancy were also significant in this model (Table 4). Women who said that avoiding pregnancy was a little or not important and those who said it was somewhat important had elevated odds of having experienced an at-risk gap (odds ratios, 2.0 and 1.5, respectively). Women who said they would be very pleased to find out they were pregnant had elevated odds of an at-risk gap compared with those who said they would feel upset or neutral about it (1.6). Similarly, women who held a fatalistic attitude toward pregnancy and birth control were more likely to have had an at-risk gap than were those who were not fatalistic (1.4).

Women who began the year using a barrier or traditional method or using no method had higher odds of experiencing an at-risk gap than those who started the year using a hormonal or long-acting method (odds ratios, 1.8 and 2.9, respectively). Moreover, women's satisfaction with their current or past contraceptive method was highly predictive: Those who reported being somewhat satisfied and those who were dissatisfied had elevated odds of an at-risk gap (1.7 and 3.4, respectively). Finally, women who felt they could not call their provider with questions were more likely than those who felt otherwise to have experienced an at-risk gap in the prior year (2.8).

•*Method switching versus continuous use of the same method.*

Age, parity and insurance coverage were significant in this model (Table 3). Women aged 35–44 were significantly less likely than those aged 18–24 to have switched methods or stopped or started a method during the past year (odds ratio, 0.5), while women with one birth were more likely than nulliparous women to have done so (1.8). Women who had no health insurance were significantly less likely to have reported such a change in contraceptive use than were those who had private insurance (0.6), possibly because they were less able to visit a provider and obtain a new method. Formerly married, noncohabiting women were less likely than married women to have switched methods or stopped or started use (0.4). Length of relationship was highly significant: Compared with women in relationships of more than four years, those in relationships of shorter duration or not currently in a relationship had significantly elevated odds of having reported such a change (1.6–7.2).

None of the pregnancy attitude items or provider-related variables were significantly associated with method switching or stopping or starting a method (Table 4). Not surprisingly, women's satisfaction with their method was strongly associated with the likelihood of switching methods or stopping or starting method use. Compared with women who were very satisfied with their method, those who were only somewhat satisfied had two times the odds of having reported such a change, while those who were neutral or dissatisfied with their method had nearly seven times the odds of having done so.

DISCUSSION

Failure to use any contraceptive method for an entire year while remaining sexually active places women at extremely high risk for unintended pregnancy. The associations of contraceptive nonuse over the past year with older age, not being in a relationship and having infrequent sex are likely to be related, in part, to nonusers' having a lower perceived risk for pregnancy than other women. These associations, combined with greater ambivalence about avoiding pregnancy among some of these women, suggest that elimination or reduction of nonuse among the relatively small group of women who are chronic nonusers may be difficult. However, while their risk for pregnancy may be relatively low, it is not nonexistent; over time, these women are at great risk for eventually having an unplanned pregnancy.

The association between socioeconomic disadvantage and both long-term contraceptive nonuse and having periods of risky nonuse is consistent with higher rates of unintended pregnancy among disadvantaged women;³ however, the determinants of this association are unclear. Contraceptive nonuse and at-risk gaps in use among less educated women, nonuse among black women and women who had not made a reproductive health care visit for two years, and at-risk gaps among women on Medicaid are likely at least partially related to the

difficulties that many disadvantaged women have in accessing health care in general.^{29,30} It is also possible that these associations reflect unmeasured factors—such as transient living conditions, unemployment or underemployment, or personal or familial instability—that are more common among disadvantaged women and that may contribute to periods when careful contraceptive behavior is especially difficult or is given lower priority. Moreover, the association between being on Medicaid and having at-risk gaps in contraceptive use may also be related, in part, to the unique characteristics of this subgroup of women—not only do Medicaid recipients have low income, but most have entered the program during a pregnancy and are therefore likely to be in their prime childbearing years.

There was a strong association between ambivalence about avoiding pregnancy and both nonuse and experiencing at-risk gaps in use. What is less clear is how to use this information in developing service-oriented recommendations. More research is needed to determine if ambivalent women who get pregnant are as likely to terminate their pregnancies or bear unwanted children as are other women with unintended pregnancies. Providers could be encouraged to identify women with ambivalent attitudes and to offer them more comprehensive counseling and assistance regarding method choice and pregnancy avoidance, as well as offer them preconception counseling so that they are better prepared to make decisions about planning healthy pregnancies.

Clinical studies often find that method discontinuation is related to difficulties in using the method.^{18–21} Although we were unable to examine the association between at-risk gaps and specific method-related problems, we were able to look at women's satisfaction with their method, which can be used as a proxy. As expected, women who reported not being very satisfied with their method had elevated risks of experiencing an at-risk gap or a method switch, suggesting that assessing method dissatisfaction could help to identify women in need of targeted assistance to maintain continuous method use. Similarly, the association between experiencing at-risk gaps in contraceptive use and being in cohabiting or nonmonogamous relationships suggests that an assessment of relationship characteristics could also help identify women at risk of inconsistent contraceptive use.

It is revealing that neither the type of provider (private doctor or clinic) nor satisfaction with one's provider was associated with contraceptive use patterns. Instead, a more important aspect may be the information that providers convey and women's confidence that their contraceptive problems or difficulties will be attended to—as demonstrated by the strong associations between women's feeling about whether they could call their providers with method use questions and both contraceptive nonuse and experiencing at-risk gaps.

By definition, women who switched methods or who stopped or started a method because of a gap when they

Women who are dissatisfied with their method are at high risk for stopping use and experiencing a period of unprotected risk of pregnancy.

were not at risk did not experience any periods during the past year when they were at highest risk of unintended pregnancy: They successfully obtained and used contraceptives during every month when they were at risk. Nevertheless, their changes and interruptions in method use may entail some risk during the early months of using a new method. It is not surprising that these changes were associated with age and relationship status but not with most socioeconomic characteristics. Younger women and women in relationships of relatively short duration were more likely than others to have changed methods or stopped or started a method in the prior year, consistent with their being at a stage of life when they may be experimenting with different methods or moving into or out of sexual partnerships. However, the fact that women without health insurance were significantly less likely than those with coverage to have switched methods or stopped or started a method suggests that some who might have wanted to switch were constrained from doing so because they lacked coverage.

One of the most important measures distinguishing women who continuously used the same method from those who switched methods or who stopped or started a method when they were not at risk was method satisfaction. Women who were neutral about or dissatisfied with their method had nearly seven times the odds of having changed methods or stopped or started method use during the year compared with those who were very satisfied. In one sense, this is a positive finding, indicating that women who have problems with and need to adjust their method are able to do so. This finding also reinforces the value of offering women a variety of contraceptive methods to choose from. Women's preferences and needs differ, and these may change over time along with their changing relationships and lifestyles.

Limitations

Because our primary focus was on investigating behavior related to the prevention of unintended pregnancy, we did not explicitly measure behaviors to prevent STDs. However, for women who are at risk of both STDs and unintended pregnancy, this combined risk may influence their method use pattern and switching behavior. Some of our sexual partnership variables (duration of current relationship, having multiple partners and a woman's belief that her partner has had multiple partners) partly capture STD risk, but they are not sufficient to do so. A second limitation is our focus on explaining the use of any contraceptive method compared with nonuse (whether for all of the past year or for one or more months during that year): We did not examine the type of method used or how well women actually used their methods. We plan to address these important components of understanding and improving use in subsequent analyses. In addition, we interviewed only women and so lack information from their male partners, whose characteristics, attitudes and preferences may affect women's patterns of contraceptive use.

Finally, several methodological aspects of our study may have affected our results. Like all data from retrospective surveys, these data may be affected by response error or recall bias. We attempted to minimize these problems by weighting the sample to match the national distribution of women on key characteristics and by including questions designed specifically to help women remember events. Another potential limitation is non-response bias from the exclusion of women who did not have telephones or who were unable or unwilling to be interviewed. Again, our weighting scheme was designed to mitigate these biases, and the similarities between our sample and the NSFG sample on key contraceptive use characteristics suggests that our findings are nationally representative; however, our sample may be biased in other ways. Another limitation is that we did not measure attitudes and method satisfaction preceding the 12-month period before interview; our measures therefore cannot be considered predictors of method use. For some women, these measures may have changed over the course of the year. This bias likely dilutes the relationship of these explanatory variables to contraceptive use, but is unlikely to have produced spurious associations.

Implications

Our results suggest a number of strategies that providers could adopt to better meet the needs of women in avoiding unintended pregnancy. When serving women who have not used a method for long periods of time, providers should ensure that they understand their risk of getting pregnant, the options available for preventing conception and, if they lack insurance coverage, the availability of low-cost care at clinics. Unfortunately, many women who are long-term nonusers do not seek regular care. Outreach and community education may also be needed to ensure that this information is available to all women at risk of unintended pregnancy.

These findings also suggest strategies for helping women maintain uninterrupted contraceptive use when they are at risk of getting pregnant. Providers should discuss women's attitudes toward preventing pregnancy and advise them about the value of planning births and preparing for pregnancies. Women with low motivation to prevent pregnancy may need additional counseling on method choice and continuation. Furthermore, providers need to ensure that all women understand the side effects and benefits of different methods and receive adequate counseling during periods of method transition. Women who are dissatisfied with their method are at high risk for stopping use and experiencing a period of unprotected risk of pregnancy. Providers therefore need to make an explicit effort to assess women's difficulties with their methods and to address problems promptly.

Overall, our results demonstrate that health care providers need to regularly revisit their clients' contraceptive choices; for most women, use is not static and their needs may change over time. Moreover, the types of factors

associated with risky contraceptive use patterns suggest a critical need to foster decisive attitudes toward preventing pregnancy, to encourage regular communication with providers, to identify women whose sexual relationships may put them at greater risk of inconsistent contraceptive use, and to provide better information and counseling about contraceptive methods and pregnancy risk. In addition to providers' efforts, broader societal commitment for expanding contraceptive use is needed to improve people's knowledge about pregnancy risk and contraceptive methods and to increase access to contraceptive services for all women who are at risk of unintended pregnancy.

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