

Original research article

Pull and pray or extra protection? Contraceptive strategies involving withdrawal among US adult women ^{☆,☆☆}

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Abstract

Objective: Research assessing contraceptive use often focuses on the most effective method used and suggests that very few women rely on withdrawal. We adopted a new measurement strategy in an attempt to measure contraceptive practices and withdrawal in particular.

Study design: We collected data from a national sample of 4634 US women aged 18–39; the survey was administered online in November and December 2012. We obtained information about recent use of hormonal methods and coital methods using two separate items, and we placed withdrawal first on the list of coital methods. The analysis examines several measures of withdrawal use in the last 30 days: most effective method used, any use, use with other methods and withdrawal “method mix.”

Results: Among women at risk of unintended pregnancy, 13% reported that withdrawal was the most effective method used in the last 30 days, but 33% had used withdrawal at least once. Most women who used withdrawal had also used a hormonal or long-acting method (13% of the sample) or condoms (11%) in the last 30 days, and a minority reported using only withdrawal (12%). Younger women, women in dating relationships and women strongly motivated to avoid pregnancy had some of the highest levels of “dual” use of withdrawal with condoms or highly effective methods.

Conclusion: Many women and couples in our sample used withdrawal in combination, or rotation, with condoms and highly effective methods. Findings suggest that some people who use withdrawal may be *more* versus *less* vigilant about pregnancy prevention.

Implications: Health care providers who discuss contraception should include withdrawal in these conversations. A substantial minority of individuals has used it recently, and many appear to be using it as a backup or secondary method. If dual use were more widespread, it could help reduce the incidence of unintended pregnancy.

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1. Introduction

Withdrawal, also known as pulling out or coitus interruptus, is about as effective as condoms at preventing pregnancy. The perfect-use failure rate for withdrawal is 4% compared to 3% for condoms; similarly, within the first year of use, 18% of couples relying on withdrawal will experience a pregnancy, comparable to the 17% of couples using male condoms [1]. Still, withdrawal is often perceived to be

ineffective at preventing pregnancy [2,3], and perhaps for this reason, only a small proportion of couples appear to rely on it. Data from the 2006–2010 National Survey of Family Growth (NSFG) indicate that, while more than half of women (59%) had ever used withdrawal, only 3% were currently using it [4]. But current-use figures typically represent women who used withdrawal as their *most effective* method [5]. Research has documented that withdrawal is often used with other methods, most commonly condoms [6,7], suggesting that prevalence rates in studies that focus on the most effective method [8–11] are artificially low.

Additionally, qualitative evidence suggests that some people do not consider withdrawal a “real” method [6], while others report that withdrawal is a secondary method of pregnancy prevention [12–14]. Thus, estimates of withdrawal

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prevalence may be artificially low if respondents fail to report this method even if used [6].

In a national study of US women aged 18–39, we adopted a new strategy to measure contraceptive practices. We found higher levels of withdrawal use than documented in previous research and found that most women who reported that a partner used withdrawal in the last 30 days also reported using one or more additional contraceptive methods. Several core demographic and relationship characteristics were associated with use of withdrawal, both alone and with other methods.

2. Materials and methods

Data were derived from a national longitudinal sample of women aged 18–39 who participated in the Continuity and Change in Contraceptive Use study [15]; while the larger project examines contraceptive use over an 18-month time period, the current analyses relies on the baseline data. The survey was administered online by GfK, which uses address-based sampling and a probability-based methodology to recruit panel members. If a household invited to participate in the panel lacks a computer or Internet access, GfK provides them free of charge. GfK estimates that its panel covers 97% of US households.

In order to identify women at risk of pregnancy, our baseline survey captured women who had ever had vaginal sex with a man, who were not currently pregnant, who had not had a tubal ligation and whose main sexual partner had not had a vasectomy. Over a 3-week period in late 2012, 11,365 women between the ages of 18 and 39 were invited to participate in the survey. Of those, 6658 answered the four screening items, yielding a response rate of 59%; 4647 of those were eligible to participate, and 4643 completed the full survey. Nine respondents were later deemed ineligible. Respondents could choose whether to take the survey in English or Spanish, and participants received \$10 remuneration. The survey instrument contained approximately 60 questions, and the average time for completion was 12 min. GfK obtains informed consent from all individuals prior to including them in their panel; because we did not obtain any identifying information from respondents, we were able to obtain expedited approval from the Guttmacher Institute's Institutional Review Board.

To measure contraceptive use, we adapted the strategy developed by Barber et al. [16] and assessed hormonal methods separately from coital methods. First, all women were asked:

“In the last 30 days, which of the following methods have you used, even if you used them for reasons other than birth control?: birth control pills, the birth control patch (Ortho Evra), the vaginal ring (Nuvaring), the birth control shot (Depo-Provera), the Implant (Implanon), the IUD (Mirena, copper intrauterine device).”

Follow-up items assessed reasons for use, consistency of use and average amount paid per month. All respondents

indicated whether they had had vaginal sex with a male partner in the last 30 days, and women who reported recent sexual activity were asked:

“In the past 30 days when you had sex with your partner, did you and he use any of the following at least once?: pulling out/withdrawal, condoms, natural family planning/calendar method, spermicide or some other barrier method, vasectomy, none of the above.”

Since some individuals do not consider withdrawal to be a “real” method [6], we purposely listed it first to indicate to respondents that it was eligible for reporting. (The expectation is that when a single, long list of methods is provided, respondents might stop after they have checked off methods considered to be “real” or effective.) Women who reported using more than one method were asked if the methods were used at the same time or if they switched between them.

2.1. Analytic strategy

We limited the analysis to women at risk of unintended pregnancy. In our sample of 4634 women, 21% had not had sex with a man in the last 30 days; 348 indicated they were currently trying to get pregnant, and 25 were postpartum. Excluding these groups resulted in an analytical sample of 3276 women.

We first compared a measure of most effective method used in the last 30 days to any use of each method. Patterns suggested that the former misses a substantial amount of multiple method use, and we next examined overlap in method use. Finally, we assessed associations between key sociodemographic characteristics and four different withdrawal “method mix” categories; we provided condom method mix categories for comparison. No hypotheses were tested due to the explanatory nature of the study; however, we used χ^2 statistics to test for associations between sociodemographic characteristics and method mix categories. Given the exploratory nature of the study, multivariate analyses were not conducted.

3. Results

Two thirds of the analytic sample was under the age of 30 (Table 1). Three quarters were married (50%) or cohabiting (25%), and 22% were in dating relationships. Just under two thirds of the sample (64%) was non-Hispanic white, and nearly one in five was Latina. The sample was relatively well educated, with 38% having some college and 41% having college degrees. The majority (54%) had had one or more births. Some 64% of women had private health insurance, but almost one in five (18%) was uninsured. While the analytic sample excluded women who were trying to get pregnant, 6% nonetheless indicated it was not at all important to avoid pregnancy. Half (50%) were strongly motivated to avoid pregnancy.

Table 1
Respondent characteristics, Continuity and Change in Contraceptive Use Study, Nov–Dec 2012

	Analytic sample	
	3276	100%
Total		
Age		
18–24	889	27.1
25–29	1230	37.5
30–34	655	20.0
35–39	502	15.3
Relationship status		
Married	1650	50.4
Cohabiting	812	24.8
Dating	708	21.6
Not in a relationship	106	3.2
Race/ethnicity		
White, non-Hispanic	2095	63.9
Black, non-Hispanic	299	9.1
Other, non-Hispanic	245	7.5
Hispanic	637	19.4
Education		
Less than high school	168	5.1
High school	510	15.6
Some college	1250	38.2
Bachelor's degree or higher	1348	41.1
Number births (7 missing)		
0	1478	45.7
1	673	20.6
2	677	20.8
3 or more	421	12.9
Health insurance (16 missing)		
Private	2088	64.0
Medicaid	554	17.0
Other	31	1.0
None	587	18.0
Pregnancy avoidance attitude (12 missing)		
1 Not at all important to avoid	208	6.4
2	129	4.0
3	297	9.1
4	441	13.5
5	546	16.7
6 Very important to avoid	1643	50.3

3.1. Most effective method versus any use of a method

Withdrawal was the most effective method used in the last 30 days for 13% of women (Table 2). The majority relied on the pill (35%) or the condom (21%) as their most effective method; 15% of women used long-acting reversible methods (LARC).

Patterns of any use of a method were quite different, particularly for coital methods. Almost three times as many women (33%) reported any use of withdrawal in the last 30 days. A similar, though less pronounced, pattern applied to condoms, with 35% reporting any use. For LARC and hormonal methods, the gap between the two contraceptive measures was negligible. Notably, figures for any use of a method add up to more than 100%, suggesting relatively high levels of dual or rotating use of methods, particularly withdrawal and condoms.

Table 2
Distribution of contraceptive use in the last 30 days by most effective and any use among women at risk of unintended pregnancy

Total	3276	100%
Most effective method used		
LARC	498	15.2
Pill	1134	34.6
Depo	140	4.3
Other hormonal	122	3.7
Condom	683	20.8
Withdrawal	422	12.9
NFP	28	0.9
Other barrier	10	0.3
No method	239	7.3
Any use of method		
Pill	1157	35.3
Condom	1129	34.5
Withdrawal	1084	33.1
LARC	498	15.2
Depo	143	4.4
NFP	146	4.5
Other hormonal	135	4.1
Other barrier	69	2.1
No method	239	7.3

NFP = Natural family planning.

3.2. Withdrawal and overlapping methods

Overall, 39% of users of highly effective methods reported their partner had also used condoms or withdrawal in the last 30 days. Just under one in four (23%) reported using withdrawal at least once, similar to the proportion that had used condoms (24%) (Table 3). Withdrawal was reported by a substantial minority of women using each type of highly effective method, including 13% of LARC users and 28% of pill users. In response to additional survey questions, 77% of users of withdrawal and highly effective methods reported using these methods at the same time, and an additional 13% reported that the methods were sometimes used simultaneously and that they sometimes switched between methods (data not shown).

We found substantial overlap between condom and withdrawal use: 33% of women who relied on condoms

Table 3
Use of withdrawal, condoms or both in last 30 days, with other methods and with each other, among women at risk of unintended pregnancy

	Withdrawal	Condoms	Either/both	Neither	Unweighted N
Any highly effective	23.1	23.5	38.9	61.1	1894
LARC	13.1	11.4	21.1	78.9	498
Pill	27.7	29.3	46.9	53.1	1157
Depo	23.1	20.3	38.5	61.5	143
Patch or ring	27.4	24.4	43.0	57.0	135
Condom	32.9	NA	100	0	1129
Withdrawal	NA	34.2	100	0	1084

also reported using withdrawal, and 34% of withdrawal users reported using condoms. Among those who used both condoms and withdrawal, 38% reported using these methods at the same time, 42% reported switching between the two methods, and 20% reported using both strategies.

3.3. Characteristics associated with withdrawal use

To further understand how withdrawal is used in combination with other methods, we examined patterns and correlates of multiple method use among withdrawal users (Table 4). Notably, only a minority of withdrawal users (12% of the entire sample) relied on this method exclusively,

and most had also used a highly effective method (13%) or condoms (11%) in the last 30 days.

Any use of withdrawal was most common among the youngest women, and use decreased with age. However, while 41% of women aged 18–24 used withdrawal, only 10% relied solely on this method. More commonly, young adults used withdrawal with condoms (17%) or highly effective methods (21%). Any use of withdrawal, as well as use with highly effective methods, was highest among women who were in a dating relationship, and only 11% relied only on withdrawal. Married women had the lowest levels of any use of withdrawal (26%), but, similar to women in dating relationships, 11% relied only on this method.

Table 4

Percentage distribution of women using any withdrawal, only withdrawal and withdrawal with other methods (with parallel measures for condoms) by selected characteristics

	Withdrawal				Condoms								
	N	Any use of withdrawal	p	Only withdrawal	p	Dual or rotating use with..		Any use of condoms	p	Only condoms	p	with highly effective methods ^a	p
						Highly effective methods ^a	Condoms						
Total	3276	33.1		11.5		12.9	11.3		34.5		12.9		13.3
Age group			.000		.230		.000		.000		.084		.000
18–24	889	40.7		10.3		20.5	17.3		42.0		11.2		21.6
25–29	1230	32.8		11.0		13.9	10.3		33.0		12.4		12.6
30–34	655	28.4		12.2		7.6	7.9		31.0		13.9		9.3
35–39	502	26.3		13.7		4.0	7.6		29.3		15.7		5.6
Relationship status			.000		.028		.000		.000		.002		.000
Married	1650	26.2		11.0		6.9	8.5		30.8		14.2		7.9
Cohabiting	812	38.3		13.7		17.1	10.1		29.3		9.2		14.3
Dating	708	43.2		11.2		21.5	18.1		46.2		13.1		22.9
Not in a relationship	106	32.1		4.7		17.0	18.9		51.9		17.9		26.4
Race/ethnicity			.000		.000		.004		.012		.029		.236
White, non-Hispanic	2095	29.9		9.2		13.1	10.1		32.8		12.0		13.5
Black, non-Hispanic	299	44.1		16.7		15.4	15.1		40.1		14.7		13.4
Other, non-Hispanic	245	44.1		16.7		17.6	15.1		38.8		14.7		14.3
Hispanic	637	34.1		14.6		9.4	12.1		35.5		14.3		12.2
Education			.000		.000		.046		.030		.223		.081
Not a high school graduate	168	25.0		10.7		6.0	7.1		30.4		14.3		8.9
High school graduate	510	37.3		14.3		14.1	13.3		32.7		10.6		13.7
Some college	1250	36.4		13.8		13.2	12.5		33.7		11.9		13.4
College graduate	1348	29.5		8.3		13.1	10.0		36.4		14.5		13.6
Number of births			.005		.014		.000		.010		.000		.19
0	1494	35.9		9.6		17.9	13.2		39.0		12.1		19.1
1	673	32.1		11.7		11.9	11.1		33.6		13.5		11.1
2	681	31.1		13.4		7.9	9.3		27.9		12.2		7.5
3+	421	27.6		14.3		5.0	8.6		30.9		15.9		5.7
Health insurance			.024		.001		.013		.249		.039		.000
Private	2088	31.5		10.1		13.9	10.7		35.2		13.1		14.8
Medicaid	554	34.8		11.9		13.4	11.7		30.0		7.8		13.4
Uninsured or "other"	618	37.1		15.5		9.4	13.1		36.4		16.9		8.7
How important to avoid pregnancy ^b			.003		.052		.000		.000		.000		.586
Not all (1)	208	24.0		14.9		3.4	4.8		19.7		10.6		4.3
In between (2–5)	1413	32.0		12.3		11.0	9.7		30.8		13.0		9.2
Very (6)	1643	35.2		10.2		15.8	13.6		39.4		13.1		17.8

All p values were calculated using the χ^2 test.

^a Highly effective methods include intrauterine devices, implants, pills, patch, ring or Depo.

^b Responses were based on a 6-point scale where "1" indicated "not at all important" and "6" indicated "very important."

Black women and those of an “other” race/ethnicity had the highest levels of reliance on any withdrawal use (44%), while reliance only on withdrawal was lowest among white women (9%). Women with college degrees had the lowest levels of reliance on only withdrawal (8%). Use of withdrawal decreased with number of births, but women with no births had the lowest level of reliance on only withdrawal (10%). The proportion of women relying only on withdrawal was higher among those who lacked health insurance (16%). Finally, women who expressed a strong pregnancy avoidance attitude had higher levels of reliance on withdrawal (35%), and about half of these (16%) were using this method in combination with a highly effective method.

Patterns in condom use were similar, the main exception being that education was not associated with condom method mix patterns.

4. Discussion

American women and their partners may be using withdrawal more often than documented in prior national surveys. Compared to the NSFG, a substantially higher proportion of women in our sample reported withdrawal as their most effective method: 13% versus 3% (or 5% when sterile couples are excluded from the NSFG, as they are here) [4]. We also found that 33% of our sample has used withdrawal at least once in the last 30 days, and withdrawal was used as commonly as condoms. Several small studies suggest that withdrawal is underreported on questionnaires that provide a single list of methods given that some individuals do not consider it to be a “real” or effective method [6,17]. We suspect that the higher reliance on withdrawal found in our study is due, at least in part, to our strategy of listing “withdrawal” first on the list of coital methods, which may have resulted in more complete reporting.

The second key finding is that the majority of women and couples in our sample using withdrawal had also used another method in the last 30 days. Most women who were using highly effective methods reported that withdrawal was used at the same time, suggesting that many were “doubly protected” from the risk of pregnancy. It may also be possible that male partners were unaware of women’s use of hormonal contraception or were using withdrawal out of personal preference for their own reassurance [13,18].

Use of withdrawal in conjunction with condoms appears to follow a different pattern. While a substantial minority of women reported that their partners used condoms and withdrawal at the same time, a similar proportion reported switching between methods, and more than 1 in 10 reported adopting both strategies. Some couples may rely on condoms during the “fertile” time of the month but use withdrawal when the perceived risk of pregnancy is lower. Alternately,

given some men’s and women’s dislike of condoms [19–21], rotating between the two methods could represent compromises and negotiations that are part of some couples’ contraceptive strategies.

Several unexpected findings are worth noting. For example, we found that LARC users were as likely to report use of withdrawal (13%) as they were to report use of condoms (11%). It is possible that some women and couples use withdrawal because they assume it reduces the risk of STIs [22]. Alternately, some women may have been interpreting the response category “pulling out/withdrawal” differently than we intended (e.g., a male partner pulled out to put on a condom). This interpretation could account for the higher levels of withdrawal reporting in our study among all respondents, not just those using LARC. A randomized study in which withdrawal appeared lower on the list of coital methods for half the sample would determine whether listing it first results in more accurate reporting.

Similarly, our study suggests that some people who use withdrawal may be *more* versus *less* vigilant about pregnancy prevention. We found that withdrawal use in conjunction with other methods was more common among younger women, those in dating relationships and those more strongly motivated to avoid pregnancy. One potential interpretation of these associations is people are more likely to “double up” when the perceived costs of an unintended pregnancy are particularly consequential.

Findings should be considered in light of study limitations. While our sample was drawn from a nationally representative panel, only 59% of the women asked to participate filled out the survey. The fact that the sample was drawn from a panel recruited specifically to participate in online surveys may also have biased the results. Thus, the actual incidence of withdrawal in the population may vary from our findings. We cannot assume that dual or rotating method use that involves withdrawal results in more consistent use. For example, if condoms and withdrawal are used “at the same time” but not every time a couple has sex, they would still be at risk of unintended pregnancy [23]. Similarly, the current study measures *any* use of withdrawal in the last 30 days, and women who had sex multiple times but only used withdrawal once would also be at increased risk.

We encourage health care providers and sexual health educators who discuss contraception to include withdrawal in these conversations. Many men, women and couples may be using withdrawal as a backup or secondary method; if this strategy were more widespread, the incidence of unintended pregnancy could be reduced. Additionally, if individuals are under the impression that withdrawal does not substantially reduce the risk of pregnancy, they may put less effort into using it consistently. Increased awareness of the pros and cons of withdrawal has the potential to result in lower contraceptive failure rates. Finally, reliance only on withdrawal is not advisable for some individuals, and discussions of the method should emphasize that it does not provide protection against STIs.

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