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Validity of Perceived Weight Gain in Women using Long-acting Reversible Contraception and Depot Medroxyprogesterone Acetate

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Abstract

Objective—To evaluate perceived weight gain in women using contraception and determine the validity of self-reported weight gain.

Study Design—We analyzed data from new contraceptive method users who self-reported weight change at 3, 6, and 12-months after enrollment. We examined a subgroup of participants with objective weight measurements at baseline and 12-months to test the validity of self-reported weight gain.

Results—Thirty-four percent (1,407/4133) of participants perceived weight gain. Compared to copper intrauterine device users, implant users [relative risk (RR)=1.29, 95% confidence interval (CI), 1.10–1.51] and depot medroxyprogesterone acetate (DMPA) users [RR=1.37, 95% CI, 1.14–1.64] were more likely to report perceived weight gain. Women who perceived weight gain experienced mean weight gain of 10.3 pounds. The sensitivity and specificity of perceived weight gain were 74.6% and 84.4%, respectively.

Conclusions—In most women, perceived weight gain represents true weight gain. Implant and DMPA users are more likely to perceive weight gain among contraception users.

Keywords

contraception; perceived weight gain; reproductive-age women; weight gain

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Reprints will not be made available.

INTRODUCTION

Reported weight gain is one of the main reasons why women are not satisfied with their contraceptive method.[1, 2] In clinical studies evaluating the subdermal implant, 13.7% of users reported weight gain as an adverse effect of the method and 2.3% reported weight gain as the reason for having their implant removed (Implanon package insert. Roseland, NJ: Organon USA Inc; 2006). However, perceived weight gain is rarely validated with objective measures.

The literature regarding contraception and objective measurements of weight gain has focused on certain methods, mainly oral contraceptives and depot medroxyprogesterone acetate (DMPA). Currently, DMPA is the only contraceptive method consistently associated with significant weight gain.[3–5] However, the literature fails to address how women *perceive* various contraceptive methods to affect their weight, and if their perception of weight gain is accurate.

Regardless of accuracy, a woman's perception of her weight while using a contraceptive method may be just as important as the number on a scale, particularly regarding method satisfaction and continuation. In a study on self-weighing frequency and weight loss, 20% of adults at baseline reported they never weigh themselves, and 40% reported weighing themselves less than once a week.[6] Therefore, many Americans rely on perceived weight as a method of weight assessment.

The purpose of this analysis is to evaluate perceived weight gain during the first 12 months after women started a new contraceptive method and to determine the validity of self-reported weight gain. To test the accuracy of perceived weight gain, we examined a subset of women who also received height and weight measurements at baseline and 12-months post-enrollment.

MATERIALS AND METHODS

This is a secondary analysis of the Contraceptive CHOICE Project. CHOICE is a prospective cohort study developed to promote the use of long-acting reversible contraception (LARC). The study provides contraception for 2–3 years at no-cost to 9,256 women in the St. Louis area in an effort to reduce unintended pregnancies in our region. English or Spanish speaking women between 14 and 45 years were eligible for the study if they: 1) resided in the study's designated recruitment region; 2) were willing to start a new method of reversible contraception or were currently not using any method; 3) did not desire to become pregnant for at least 12 months; and 4) were sexually active with a male partner or planning to become sexually active in the next 6 months. Women were excluded if they had a history of tubal sterilization or hysterectomy. Study enrollment began in August 2007 and ended in September 2011.

All enrolled participants received contraceptive counseling at one of the designated recruitment sites, which included the university-based clinic, two abortion clinics, and several community-based clinics. Counseling sessions at the university-based clinic presented women with all reversible contraceptive methods and their associated effectiveness, side effects, benefits and risks to help participants make an informed decision. Counseling sessions at the remaining clinics were based upon what was usual contraceptive counseling for that clinic location. Also during the baseline visit, a comprehensive assessment was performed to collect demographic and reproductive history information, screen for sexually transmitted infections, and measure height and weight. The woman's baseline body mass index (BMI) was calculated as weight (kg)/height $(m)^2$ and categorized

into one of the following BMI groups: underweight (<18.5 kg/m^2), normal (18.5–24.9), overweight (25–29.9), or obese (≥30).

We performed telephone interviews using standardized survey instruments at 3 and 6 months post-enrollment, and every six months for the duration of follow-up. Participants were compensated with a $10.00 gift card at each interview. During the follow-up surveys, participants were asked to self-report any changes in their weight. Specifically, the survey question asked, "Since we last spoke, has your weight changed by 5 pounds or more?" If the participant answered "yes," she was further asked, "Did you (a) gain weight, (b) lose weight, (c) both gain and lose weight, or (d) you don't know?" This question was not included until a revised version of the survey introduced on July 1, 2008. Therefore, only participants that answered this question are included in this analysis.

For this analysis, we evaluated women's perceived weight change during the first 12 months of starting a new contraceptive method using data from their 3, 6, and 12-month surveys. A participant was excluded from the analysis if we could not reach a definite conclusion regarding her direction of perceived weight change over 12 months. For example, a participant was excluded if she was missing a response to the question above in any of the 3, 6, or 12-month surveys or had responded "yes" to weight change but was missing a response to how her weight had changed (i.e. weight gain or loss). In addition, if a participant ever reported "both weight gain and weight loss" or "don't know" to the question "how did your weight change?" in any of the 3, 6, or 12-month follow-up surveys, she was excluded from the analysis sample as we could not determine the direction (gain or loss) of her weight change. Finally, if a participant's combined responses of all three surveys included any combination of "gain" and "loss," she was excluded because we could not determine her net sum of perceived weight change as we had no way of knowing which weight change was the most prominent.

We defined three groups: 1) perceived weight gain; 2) perceived no weight change; and 3) perceived weight loss. Group 1 (perceived weight gain) included any participant who reported "weight gain" in at least one of her 3, 6, or 12-month surveys and reported "no change" at all of the remaining 3, 6, or 12-month survey(s). Group 2 (perceived no weight change) included participants who, at all of the 3, 6, and 12-month follow-up surveys, responded, "No, my weight has *not* changed by 5 pounds or more since we last spoke." Group 3 (perceived weight loss) included any participant who reported "weight loss" in at least one of her 3, 6, or 12-month surveys and reported "no change" at all of the remaining 3, 6, or 12-month survey(s).

All women enrolled in CHOICE on or after June 15, 2010 were offered eligibility screening and, if eligible, enrolled in a separate substudy to objectively assess 12-month weight change with progestin-only methods or the copper IUD. Eligibility for this substudy included: 1) CHOICE enrollment at the university-based clinic (in order to retain consistency in scale used to assess weight); 2) 18 years of age or older; 3) using the levonorgestrel intrauterine system (LNG-IUS), copper T380A IUD, subdermal implant, or depot medroxyprogesterone acetate (DMPA) as current method; 4) continued use of one of the above methods for at least 11 months; and 5) willingness to return to the university-based clinic for a 12-month visit for an objective weight assessment. At the time of data analysis, 415 women had enrolled and completed this substudy of objectively measured weight change. We calculated the participant's observed weight change by subtracting her recorded weight at baseline from the recorded weight at her 12-month follow-up. The observed weight change was classified as: a *'gain'* if the calculated weight change was a ≥5 pound increase; *'no change'* if the calculated weight change was less than a 5-pound change in either direction; and a *'loss'* if the calculated weight change was a ≥5 pound decrease. We

chose a 5-pound change to be consistent with our survey instrument. The observed weight change categories 'gain,' 'no change,' and 'loss' were then compared with the perceived weight change groups (1, 2, and 3) as previously defined. To estimate sensitivity, specificity, agreement, and relative risk calculations, we combined group 2 (perceived no weight change) and group 3 (perceived weight loss) to create a dichotomous variable for perceived weight gain: 'yes' (perceived weight gain) or 'no' (no perceived weight gain). We created a similar variable for objective weight gain, where the no weight gain group included the measured "no change" and "weight loss" groups.

The CHOICE protocol and substudy described above were approved by the Washington University in St. Louis School of Medicine Human Research Protection Office. The methodic details of the Contraceptive CHOICE Project have been published in a separate report.[7]

Statistical analyses

We compared the baseline demographic and behavioral characteristics among the three perceived weight change groups—gain, no change, and loss—in both the CHOICE analysis sample and our substudy sample using chi-square or Fisher exact test where appropriate. We compared the mean objective weight change of the three perceived weight gain groups in the substudy using a one-way ANOVA test. We calculated a Kappa statistic to evaluate the agreement between objective and perceived weight gain. We calculated the sensitivity and specificity of perceived weight gain compared to the gold standard of objectively measured weight gain. We also calculated the relative risk (RR) of perceived weight gain by contraceptive methods and 95% confidence intervals (CI) from Poisson regression using the SAS GENMOD procedure. This approach provides an unbiased estimate of the relative risk in the case of common outcomes (greater than 10%). Confounding was defined as a greater than 10% relative change in the association between perceived weight gain and method choice with or without the potential confounding factor in the model. Confounders were included in the final model to obtain an adjusted RR of perceived weight gain among contraceptive methods. All statistical analysis was performed using SAS 9.2 software. The significance level alpha was set at 0.05.

RESULTS

Of the 7,977 CHOICE participants who reached 12-months at the time of data analysis, 4,133 women met our inclusion criteria. Among the 3,844 women excluded, 2968 had missing data regarding the weight question or the specific direction of weight change and 1,146 reported both weight "gain" and "loss". We found no significant differences in demographic and behavioral characteristics between the analysis sample and the women who were excluded because of inclusion criteria or inability to reach a definite conclusion regarding their weight change. Of the 4,133 women in the analysis sample, 1,407 (34.0%) perceived weight gain, 1,634 (39.5%) perceived no weight change, and 1,092 (26.4%) perceived weight loss.

Table 1 displays the demographic and behavioral characteristics of the analysis sample and the three perceived weight change groups: gain, no change, and loss. Women who perceived weight gain were significantly more likely to be African American, parous, uninsured, and less educated. The participants in the weight gain group were also more likely to have trouble paying for basic necessities and receive public assistance. General health was highest among those who reported no perceived weight change. Compared to women who were normal or underweight at baseline (n=1,882), women who were overweight or obese at baseline (n=2,251) were more likely to report perceived weight gain (36.7% versus 30.9%)

and weight loss (30.5% versus 21.5%), and less likely to report no weight change (32.8% versus 47.6%).

Table 2 presents the demographic and behavioral characteristics for the subgroup of participants who received an objective measurement of weight change at baseline and 12 months. Of the 415 women who completed this assessment, 281 participants met the inclusion criteria. We found no differences when we compared excluded participants to those included in the analysis sample. Black race, lower socioeconomic status, higher baseline BMI, and use of DMPA or the implant were significantly associated with perceived weight gain.

The mean weight change over 12 months for the total subset of women with objective weight change assessment was a 2.2 pound increase. The three perceived weight change groups—gain, no change, and loss—experienced a mean weight change of 10.3 pounds gained, 1.5 pounds gained, and 9.5 pounds lost, respectively (P<.001). Of the 114 women who objectively gained 5 pounds or more during the 12 month period, 85 perceived weight gain. Conversely, among the 167 who did not gain ≥5 pounds, 141 perceived no weight gain. Therefore, the sensitivity and specificity of perceived weight gain was 74.6% (85/114) and 84.4% (141/167), respectively. Additionally, we calculated a Kappa statistic to measure the agreement between perceived weight gain and actual weight gain. The tests demonstrated moderate to good agreement (Kappa=0.59, P<.0001). The positive predictive value for perceived weight gain was 77%.

Figure 1 presents perceived weight change by contraceptive method. Each bar represents the total number of women using the specified method at baseline. The subdermal implant and DMPA showed the most perceived weight gain of all reversible methods analyzed. Forty-one percent of implant users and forty-six percent of DMPA users perceived weight gain of 5 pounds or more. Table 3 shows the crude and adjusted relative risk of perceived weight gain for each contraceptive method compared to the copper IUD. After adjusting for race, implant (RR=1.29, 95% CI: 1.10, 1.51) and DMPA (RR=1.37, 95% CI: 1.14–1.64) users were significantly more likely to perceive weight gain compared to copper IUD users. LNG-IUS, pill, patch, and ring users were no more likely to perceive weight gain compared to copper IUD users.

COMMENT

We found perceived weight gain to be a reasonable measure of objective weight gain. Although not a perfect measure, most women (77%) who self-reported weight gain were objectively found to have gained 5 pounds or more over 12 months. In addition, participants who perceived weight gain were found to have gained an average of 8.8 pounds more over 12 months than the group that perceived no change ($p < 0.001$). Our results suggest that self-reported weight change may be a reasonable proxy for true weight gain, and may be a practical way for clinicians and epidemiologists to monitor patients' weight changes. Pronk and colleagues also noted that self-reported weight is an acceptable alternative given circumstances where it is difficult or inefficient to obtain measured weight.[8]

Currently, over one-half of reproductive-age women in the United States have a BMI greater than 25 kg/m^2, which, according to the CDC's standard weight status categories, classifies them as overweight or obese.[9] Similarly, 54.5% of women in our analysis had a BMI greater than 25 kg/m^2 at baseline, placing them into the overweight or obese BMI categories. Over one-third (37%) of the overweight and obese women in our analysis perceived weight gain. This finding is alarming; in addition to already being at an unhealthy weight, many subsequently reported a weight gain of at least 5 pounds over twelve months. Our results indicate that this is true weight gain for most women.

Because of the many adverse physical and mental health effects that commonly accompany obesity, it is important for clinicians to be aware of their patients' weight gains. It may be useful, as well as simple and cost-effective, to have women report perceived weight changes to their primary care provider at regular intervals. This perceived change may be a trigger for an objective assessment. If validated, the clinician may suggest weight loss strategies or consider screening for diseases associated with obesity, such as diabetes or hypertension.

We were interested in perceived weight gain and its association with certain contraceptive methods. We found that almost one-half of implant and DMPA users (40.9%, 46.1% respectively) perceived weight gain. As stated earlier, DMPA is the one method that has been consistently associated with significant weight gain in previous studies.[3–5] To our knowledge, there are few studies addressing weight gain or perceived weight gain with the use of the etonogestrel implant. Future studies should determine if the subdermal implant is associated with the objective evidence of weight gain. Understanding that some contraceptive methods have higher rates of perceived weight gain could prove helpful to clinicians when counseling their patients. It also may be helpful for clinicians to understand that certain patient characteristics (e.g. race, social economic status, education, parity, baseline BMI, etc.) are more likely to be associated with perceived weight gain.

Strengths of our analysis include a relatively large sample size and a diverse sample in terms of race and socioeconomic status. Our population reflects the St. Louis population, but may not be generalizable to other U.S. populations. As a note of caution, the perceived weight gain group in Table 1 (n=1407) is ten times as large as the objective weight gain group in Table 2 (n=111). Thus, associations in the perceived weight gain group were more likely to be statistically significant (due to larger samples size and power); whereas, few associations were statistically significant in the objective weight gain group due to smaller sample size.

One limitation of our study includes the definition of perceived weight gain and loss. Since the survey question asked about weight change in intervals (since the participant's last survey), and not since the woman started her method, it was challenging to clearly define self-reported weight change over 12 months. Women who reported both weight gain and weight loss during the 12 months were excluded from the analysis, even though their net weight change may have been greater than 5 pounds in either direction. In addition, participants were asked if they perceived a weight change of 5 pounds or more. Thus, a participant may have perceived a weight gain, but if it was less than 5 pounds, she reported no weight change. If the woman perceived a 3 or 4 pound weight gain at each of the surveys, she may have perceived an overall 9–12 pound weight gain over 12-months, yet, her responses placed her in the perceived no weight change group. Another limitation of our study is that CHOICE is an observational study, not a randomized trial; thus, there is still the potential for residual bias despite our efforts to control for confounding variables. Biological plausibility does support our findings. Finally, there is reason to believe that media may have influenced participants' reports and their associations of weight gain with certain contraceptive methods. For example, DMPA has been widely reported to be associated with weight gain and many women are aware of this association; therefore, women using DMPA may have been more likely to report weight gain.

In conclusion, self-reported weight change is easy to obtain and in most women, represents true weight gain. The perception of weight gain is clinically important, because it may affect a woman's satisfaction with her contraceptive method or influence a woman's decision to continue use of the method. Future studies should consider interventions that can promote healthy weight control, especially in women at high-risk for weight gain, and should assess the relationship between perceived weight gain and contraceptive continuation and satisfaction.

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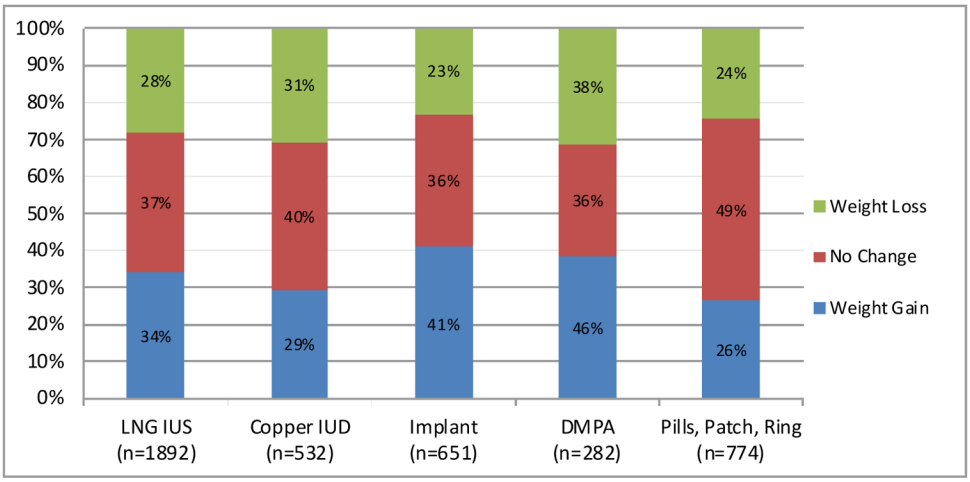

Figure 1.
Percent of women reporting weight change by baseline contraceptive method

Table 1

Baseline Demographic and Behavioral Characteristics of Study Participants

Characteristics	Analysis Sample (n=4133)	Perceived Weight Gain (n=1407)	Perceived No Weight Change (n=1634)	Perceived Weight Loss (n=1092)	*P*
Age (y)*					.042
<21	851 (20.6)	300 (21.3)	342 (20.9)	209 (19.1)	
21–25	1624 (39.3)	511 (36.3)	670 (41.0)	443 (40.6)	
>25	1658 (40.1)	596 (42.4)	622 (38.1)	440 (40.3)	
Race*					<.001
Black	1989 (48.1)	823 (58.5)	725 (44.4)	441 (40.4)	
White	1810 (43.8)	472 (33.5)	778 (47.6)	560 (51.3)	
Other	334 (8.1)	112 (8.0)	131 (8.0)	91 (8.3)	
Marital Status*					.011
Single	2432 (58.9)	845 (60.1)	972 (59.6)	615 (56.3)	
Living with partner	900 (21.8)	289 (20.6)	345 (21.1)	266 (24.4)	
Married	551 (13.3)	169 (12.0)	234 (14.3)	148 (13.5)	
Separated/Divorced/Widowed	247 (6.0)	103 (7.3)	81 (5.0)	63 (5.8)	
Insurance*					<.001
None	1668 (40.6)	641 (45.8)	621 (38.2)	406 (37.3)	
Private	1873 (45.5)	535 (38.3)	806 (49.6)	532 (48.9)	
Public	571 (13.9)	222 (15.9)	199 (12.2)	150 (13.8)	
Education*					<.001
High school diploma/GED or less	1363 (33.0)	546 (38.8)	490 (30.0)	327 (30.0)	
Some College	1662 (40.2)	572 (40.7)	639 (39.1)	451 (41.3)	
College degree or graduate school	1107 (26.8)	288 (20.5)	505 (30.9)	314 (28.7)	
Trouble paying for basic expenses*					<.001
No	2608 (63.2)	771 (54.9)	1138 (69.8)	699 (64.0)	
Yes	1519 (36.8)	633 (45.1)	493 (30.2)	393 (36.0)	
Receiving Public Assistance*					<.001
No	2680 (64.9)	816 (58.1)	1136 (69.6)	728 (66.7)	
Yes	1448 (35.1)	589 (41.9)	496 (30.4)	363 (33.3)	

Characteristics	Analysis Sample (n=4133)	Perceived Weight Gain (n=1407)	Perceived No Weight Change (n=1634)	Perceived Weight Loss (n=1092)	*P*
Parity*					<.001
Nulliparous	2030 (49.1)	608 (43.2)	867 (53.1)	555 (50.8)	
Parous	2103 (50.9)	799 (56.8)	767 (46.9)	537 (49.2)	
Baseline BMI (kg/m^2)*					<.001
Underweight (<18.5)	211 (5.1)	45 (3.2)	125 (7.7)	41 (3.8)	
Normal (18.5–24.9)	1671 (40.4)	537 (38.2)	770 (47.1)	364 (33.3)	
Overweight (25–29.9)	1040 (25.2)	376 (26.7)	360 (22.0)	304 (27.8)	
Obese (≥30)	1211 (29.3)	449 (31.9)	379 (23.2)	383 (35.1)	
Baseline Method*					<.001
LNG IUS	1892 (45.8)	650 (46.2)	705 (43.2)	537 (49.2)	
Copper-IUD	532 (12.9)	156 (11.1)	212 (13.0)	164 (15.0)	
Implant	651 (15.8)	266 (18.9)	233 (14.3)	152 (13.9)	
DMPA	282 (6.8)	130 (9.3)	102 (6.2)	50 (4.6)	
Pills, Patch, Ring	774 (18.7)	204 (14.5)	381 (23.3)	189 (17.3)	
General Health (Baseline)*					<.001
Excellent	1199 (29.1)	352 (25.1)	545 (33.4)	302 (27.7)	
Very good	1681 (40.7)	549 (39.2)	659 (40.4)	473 (43.3)	
Good	1016 (24.6)	399 (28.4)	365 (22.3)	252 (23.1)	
Fair	215 (5.2)	94 (6.7)	61 (3.7)	60 (5.5)	
Poor	15 (0.4)	8 (0.6)	3 (0.2)	4 (0.4)	
General Health (12 months)*					<.001
Excellent	1012 (24.6)	267 (19.0)	475 (29.2)	270 (24.8)	
Very good	1651 (40.1)	522 (37.2)	689 (42.4)	440 (40.3)	
Good	1115 (27.1)	433 (30.9)	383 (23.6)	299 (27.4)	
Fair	322 (7.8)	167 (11.9)	75 (4.6)	80 (7.3)	
Poor	19 (0.4)	14 (1.0)	3 (0.2)	2 (0.2)	

*Significant at alpha level of .05

†P-value calculated using Fisher Exact Test. All other p-values calculated using χ^2 test.

Data are n (%) unless otherwise specified.

GED, general education development test; DMPA, Depo-medroxyprogesterone acetate; IUC, intrauterine contraceptive; LNG, levonorgestrel; BMI, Body Mass Index.

Some n-values do not sum to total number in column heading, which accounts for missing responses.

Table 2

Baseline demographic and behavioral characteristics of women with objective weight measurements at baseline and 12 months.

Characteristics	Substudy Analysis Sample (n=281)	Perceived Weight Gain (n=111)	Perceived No Weight Change (n=100)	Perceived Weight Loss (n=70)	*P*
Age (y)					.836
<21	37 (13.2)	15 (13.5)	15 (15.0)	7 (10.0)	
21–25	110 (39.1)	45 (40.5)	39 (39.0)	26 (37.1)	
>25	134 (47.7)	51 (46.0)	46 (46.0)	37 (52.9)	
Race*					<.001†
Black	141 (50.2)	75 (67.6)	40 (40.0)	26 (37.2)	
White	128 (45.5)	35 (31.5)	53 (53.0)	40 (57.1)	
Other	12 (4.3)	1 (0.9)	7 (7.0)	4 (5.7)	
Marital Status					.413†
Single	156 (55.5)	64 (57.7)	57 (57.0)	35 (50.0)	
Living with partner	66 (23.5)	28 (25.2)	17 (17.0)	21 (30.0)	
Married	40 (14.2)	12 (10.8)	18 (18.0)	10 (14.3)	
Separated/Divorced/Widowed	19 (6.8)	7 (6.3)	8 (8.0)	4 (5.7)	
Insurance*					.011
None	90 (32.0)	44 (39.6)	28 (28.0)	18 (25.7)	
Private	151 (53.7)	51 (46.0)	64 (64.0)	36 (51.4)	
Public	40 (14.2)	16 (14.4)	8 (8.0)	16 (22.9)	
Education					.266
High school diploma/GED or less	65 (23.1)	30 (27.1)	19 (19.0)	16 (22.9)	
Some College	110 (39.2)	44 (39.6)	35 (35.0)	31 (44.3)	
College degree or graduate school	106 (37.7)	37 (33.3)	46 (46.0)	23 (32.9)	
Trouble paying for basic expenses*					.004
No	176 (62.9)	56 (50.9)	70 (70.0)	50 (71.4)	
Yes	104 (37.1)	54 (49.1)	30 (30.0)	20 (28.6)	
Receiving Public Assistance*					.001
No	180 (64.1)	60 (54.1)	78 (78.0)	42 (60.0)	
Yes	101 (35.9)	51 (45.9)	22 (22.0)	28 (40.0)	

Characteristics	Substudy Analysis Sample (n=281)	Perceived Weight Gain (n=111)	Perceived No Weight Change (n=100)	Perceived Weight Loss (n=70)	*P*
Parity *					.018
Nulliparous	129 (45.9)	46 (41.4)	57 (57.0)	26 (37.1)	
Parous	152 (54.1)	65 (58.6)	43 (43.0)	44 (62.9)	
Baseline BMI by CDC Classifications (kg/m^2)*					.035†
Underweight (<18.5)	9 (3.2)	2 (1.8)	5 (5.0)	2 (2.9)	
Normal (18.5–24.9)	121 (43.0)	39 (35.2)	55 (55.0)	27 (38.6)	
Overweight (25–29.9)	64 (22.8)	28 (25.2)	19 (19.0)	17 (24.3)	
Obese (≥30)	87 (31.0)	42 (37.8)	21 (21.0)	24 (34.3)	
Baseline Method*					.004†
LNG IUS	99 (35.2)	38 (34.2)	29 (29.0)	32 (45.7)	
Copper-IUD	73 (26.0)	18 (16.2)	35 (35.0)	20 (28.6)	
Implant	78 (27.8)	37 (33.4)	26 (26.0)	15 (21.4)	
DMPA	31 (11.0)	18 (16.2)	10 (10.0)	3 (4.3)	
General Health					.598†
Excellent	77 (27.4)	34 (30.6)	25 (25.0)	18 (25.7)	
Very good	123 (43.8)	50 (45.1)	45 (45.0)	28 (40.0)	
Good	73 (26.0)	23 (20.7)	28 (28.0)	22 (31.4)	
Fair	7 (2.5)	4 (3.6)	1 (1.0)	2 (2.9)	
Poor	1 (0.3)	0 (0.0)	1 (1.0)	0 (0.0)	
General Health at 12 months					.381†
Excellent	67 (24.0)	21 (19.1)	28 (28.0)	18 (26.1)	
Very good	124 (44.4)	48 (43.6)	42 (42.0)	34 (49.3)	
Good	71 (25.5)	34 (30.9)	25 (25.0)	12 (17.4)	
Fair	16 (5.7)	7 (6.4)	4 (4.0)	5 (7.2)	
Poor	1 (0.4)	0 (0.0)	1 (1.0)	0 (0.0)	
Objective Weight*					<.001†
Gain	114 (40.6)	85 (76.6)	26 (26.0)	3 (4.3)	
No Change	99 (35.2)	21 (18.9)	56 (56.0)	22 (31.4)	
Loss	68 (24.2)	5 (4.5)	18 (18.0)	45 (64.3)	

Characteristics	Substudy Analysis Sample (n=281)	Perceived Weight Gain (n=111)	Perceived No Weight Change (n=100)	Perceived Weight Loss (n=70)	*P*
Mean WT Change (lbs)*	2.2 ±12.2	10.3 ±9.9	1.5 ±8.1	−9.5 ±10.5	<.001‡

*Significant at alpha level of .05

‡P-value calculated using one-way ANOVA

†P-value calculated using Fisher Exact Test. All other p-values calculated using χ^2 test.

Data are n (%) or mean ± standard deviation unless otherwise specified.

GED, general education development test; DMPA, Depo-medroxyprogesterone acetate; IUC, intrauterine contraceptive; LNG, levonorgestrel. BMI, Body Mass Index.

Some n-values do not sum to total number in column heading, which accounts for missing responses.

Table 3

Risk of perceived weight gain and contraceptive method.

Method	Relative risk (95% CI)	
	Crude	Adjusted[a]
LNG IUS	1.17 (1.01–1.35)	1.13 (0.98–1.30)
Copper-IUD	Reference	Reference
Implant	1.39 (1.18–1.63)	1.29 (1.10–1.51)
DMPA	1.57 (1.31–1.88)	1.37 (1.14–1.64)
Pills, patch, ring	0.90 (0.75–1.07)	0.88 (0.74–1.05)

CI, confidence interval.

[a]Model adjusted for race.