Changes in the Use of Contraception at First Intercourse: A Comparison of the National Survey of Family Growth 1995 and 2006–2010 Databases

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Abstract

Study Objective: To determine trends in characteristics associated with contraceptive use at coitarche from 1995 to 2006–2010.

Methods: The National Survey of Family Growth (NSFG) 1995 and 2006–2010 databases were used to abstract variables of interest. Generalized linear models (GLM) were applied to examine the association between the use of contraceptive methods at coitarche and variables abstracted for each database.

Results: Of the 9599 women from the 1995 database included in this study, 3885 (40%) used contraception at coitarche in comparison to 4860 (82%) out of 5931 women assessed in 2006–2010. For both time periods, Hispanic women were significantly less likely to use contraception at coitarche when compared to White women. In the 1995 database, only women from families with incomes >\$50,000 were more likely to use contraception at coitarche, while women from families with income >\$20,000 were more likely to use contraception at coitarche in 2006–2010. There were some differences noted in the association between age at coitarche and contraception use at coitarche, but in general, women who had a higher age at coitarche were more likely to use contraception. For both time periods, women were more likely to use contraception at coitarche if they used barrier methods as their first form of contraception or if they obtained their first contraceptive method from a spouse, partner, or friend.

Conclusions: Our results suggest that access to contraception may be associated with use of a contraceptive method at coitarche. Innovative measures need to be investigated so that this young population has increased access to more reliable methods before their first sexual experience.

Introduction

ALMOST HALF OF all US pregnancies are unintended.^{1,2} Of the general population, teenagers are at the highest risk of having an unintended pregnancy.³ Teen mothers face tremendous challenges, including lost social and economic opportunities as a result of less formal education and greater emotional burden.^{4–8} Teen pregnancies are also associated with adverse pregnancy outcomes, including preterm birth and increased neonatal mortality, and result in a tremendous financial burden on society due to costs associated with welfare support, implementation of programs to empower teen mothers, and lost tax revenues as a result of lost earning potentials.^{9,10} Furthermore, it is estimated that direct medical costs of unintended pregnancies are as high as \$5 billion.¹¹

A major cause of unintended pregnancies among teenagers is delayed initiation of contraception after coitarche.¹² In a recent study analyzing data from 2006–2010, we found that there are numerous differences between women who use contraceptive methods at coitarche versus those who do not,¹³ including race, education, annual family income, religion importance, age at coitarche, number of sexual partners, type of contraception, and source of contraception. Despite these discouraging results, it is unknown whether the 2006–2010 data show improvements in use when compared to previous years, as there have been no studies comparing current prevalence to that of past years. The purpose of this study was to determine if there are differences in demographic and behavioral characteristics associated with contraceptive use at first sexual experience between female

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respondents of the 2006–2010 and 1995 National Survey of Family Growth (NSFG) surveys. Comparing such results will show whether there have been any changes in contraceptive behavior at coitarche in the past years, allowing us to better analyze current efforts to educate increased early contraceptive use. The results of this study will also help determine where future efforts on improving early contraceptive use need to be focused.

Methods

After obtaining exemption from the University of Texas, Medical Branch in Galveston Institutional Review Board, we accessed the 1995 and 2006–2010 NSFG databases for this study. The National Center for Health Statistics conducts periodic surveys on reproductive health topics, including sexual activity and contraceptive use on a nationally representative sample of the US population.¹⁴ The NSFG is an in-person interview, where respondents are given the opportunity to directly enter responses to sensitive questions onto the interviewer's laptop.¹⁵ The 1995 database includes responses from 10,847 women ages 15–44 years living in US households. Interviews were conducted from January 1995 through October 1995. The 2006–2010 database includes responses from 12,279 women ages 15–44 years living in US households. Interviews were done 48 weeks of every year from June 2006 to June 2010. Both databases had approximately similar number of female respondents, despite length of study, because the 2006–2010 NSFG was based on a different design so as to collect a constant small number of respondents over 4 years, whereas the 1995 NSFG was designed to survey a large number of women within a short period of time.¹⁶ The 1995 data did not specifically identify Hispanics as a race; therefore, Hispanics from the 2006–2010 database were coded as *other* for the purpose of comparison.

We abstracted sociodemographic information, including race, highest education, annual family income, and importance of religion. We compared outcomes between women who did and did not use contraceptive methods at coitarche. We then abstracted information regarding sexual behavior, including age at coitarche, lifetime number of sexual partners, type of first contraceptive (not necessarily at coitarche), and source of first contraceptive. These variables were chosen primarily based on our results from the antecedent study identifying associations between these factors and contraceptive use at coitarche.¹³ To facilitate interpretation of data, based on age at coitarche, patients were stratified into three categories: <16 year olds, 16–20 year olds, and >20 year olds, as many individuals initiate sexual intercourse by 16 years of age.^{17–20} In addition, the type of first contraceptive was grouped into three categories according to response: (1) Barrier methods included condoms and diaphragms, (2) Nonbarrier methods included the withdrawal method, the rhythm method, or spermicidal agents, and (3) Reliable methods included hormonal methods and the copper IUD.

For statistical analysis, the generalized linear models (GLM) with logit link and binomial distribution were applied to examine the association between contraceptive method at coitarche and the variables abstracted. Odds ratios and p-values were calculated, with a p-value of <0.05 considered significant.

Results

Overall, 88% (9599/10,847) of the 1995 study population and 48% (5931/12,279) of the 2006–2010 study population provided data for contraceptive use at coitarche. In 1995, 60% of women (5744/9599) did not use contraception at coitarche, as compared to 18% (1071/5931) between 2006 and 2010. Differences in frequencies were observed in demographic data between the 1995 data and the 2006–2010 data (Table 1). Specifically, the 2006–2010 data had (1) a larger portion of nonwhite women, (2) more women with college diplomas, (3) more women with an annual family income of greater than \$50,000, and (4) less women with one sexual partner and more with greater than five sexual partners. It was noted that 19% (2359/12,279) of women from the 2006–2010 dataset had missing data for importance of religion. In addition, 82% (8928/10,847) of women from the 1995 dataset and 75% (9250/12,279) for women from the 2006–2010 dataset had missing data for source of first contraception.

Of note, a large portion of women from the 2006–2010 database had missing data for religion importance and a large portion of women from both databases had missing data for source of first contraception.

Black and white women were similarly likely to have used birth control at coitarche in both datasets, while women categorized as *other* were less likely to use a birth control method at coitarche compared to whites (Table 2). Higher education at the time of the survey was associated with increased odds of birth control use at coitarche for both time periods. Higher income was associated with greater odds of having used contraception at coitarche in 2006–2010, but the association was nonsignificant for the comparisons between the lowest income group and those with incomes between \$20,000 and \$50,000 in the 1995 NSFG. Religious importance was not associated with contraception use at coitarche in 1995 respondents, but there were some differences in the 2006–2010 NSFG respondents. Those who felt that religion was “somewhat important” in the 2006–2010 NSFG were less likely to have used contraception at coitarche compared to women for whom religion was “very important.” There were no significant differences between those who felt that religion was “very important” compared to those who felt it was “not important” in the 2006–2010 survey.

In the 1995 NSFG survey, women were more likely to use contraception at coitarche if they were 16–20 or >20 years old at coitarche, compared to women who had coitarche at <16 years old (Table 3). In the 2006–2010 NSFG survey, however, women who were >20 years at coitarche had a similar likelihood of using contraception at coitarche when compared to women who were <16 years old. Among the women surveyed in 1995, the number of sexual partners was not significantly associated with contraceptive use. Among 2006–2010 respondents, however, women who reported two to five sexual partners were more likely to have used birth control at coitarche. There were differences in the type of contraception used at first sex among both samples. Among the 1995 respondents, women were less likely to use reliable methods than barrier methods at coitarche. There were no differences between barrier and nonbarrier methods in this group. The association between reliable methods and having used any method at coitarche was less strong in 2006–2010, but was still significantly lower compared to barrier methods. In

TABLE 1. DEMOGRAPHIC DISTRIBUTION OF 1995 AND 2006–2010 DATASETS

	1995 n (%)	2006–2010 n (%)	p-value
Age (median $\pm$ SD)	30.6 $\pm$ 8.3	28.6 $\pm$ 8.4	<0.001
Race			<0.001
White	7746 (72%)	6964 (56%)	
Black	2514 (23%)	2606 (21%)	
Other	587 (5%)	2709 (23%)	
Highest education			0.7888
Did not complete high school	2293 (21%)	3413 (28%)	
High school diploma only	3865 (36%)	2982 (24%)	
College diploma only	4257 (39%)	5192 (42%)	
Graduate degree	432 (4%)	692 (6%)	
Annual family income			<0.001
<\$20,000	2750 (25%)	3784 (31%)	
\$20,000–\$50,000	3781 (35%)	5507 (45%)	
>\$50,000	4316 (40%)	2988 (24%)	
Importance of religion			<0.001
Very important	5585 (52%)	5697 (57%)	
Somewhat important	4134 (38%)	3637 (37%)	
Not important	1123 (10%)	586 (6%)	
Missing ^a	5	2359	
Age at coitarche			<0.001
<16	2609 (26%)	3229 (31%)	
16–20	5873 (60%)	5988 (56%)	
>20	1313 (13%)	1326 (13%)	
Missing	1052	1736	
Number of sexual partners			<0.001
1	2776 (29%)	2489 (23%)	
2–5	4478 (45%)	4481 (42%)	
>5	2613 (26%)	3635 (35%)	
Missing	980	1674	
Type of contraception first used			<0.001
Barrier	3673 (38%)	5181 (48%)	
Nonbarrier ^b	1191 (13%)	659 (6%)	
Hormonal	4716 (49%)	4880 (46%)	
Other	1267	1559	
Source of first contraception			<0.001
Medical facility	831 (43%)	1424 (47%)	
Pharmacy	422 (22%)	327 (10%)	
School	14 (1%)	52 (2%)	
Spouse, partner, or friend	644 (34%)	1028 (34%)	
Other	8 (0%)	198 (7%)	
Missing	8928	9250	

^aMissing includes respondents who refused to answer questions.

^bIncludes methods such as withdrawal, rhythm method, and spermicidal agents.

addition, nonbarrier methods were less likely to have been used at coitarche compared to barrier methods. Finally, in 1995, women were more likely to have used contraception at coitarche if they had received their contraception at a pharmacy or from a spouse, partner, or friend compared to those who received their contraception at a medical facility. For the 2006–2010 respondents, only women who received their first contraception from a spouse, partner, or friend were more likely to use contraception at coitarche.

Discussion

We performed this study as an extension of a previously published study, which analyzed outcomes of the 2006–2010

database (REF). In the previous study we found that race, income, religious importance, age of coitarche, number of sexual partners, type of contraceptive method first used, and source of first contraceptive method differed significantly between women who used contraception at coitarche and those who did not. We felt that it was important to evaluate trends in these differences over time and, therefore, compared the associations from the 1995 and 2006–2010 datasets.

The distribution of education level did not vary significantly between both databases; however, the annual family income did vary in that a greater portion of the 1995 female respondents reported higher annual family incomes than the 2006–2010 female respondents. This could have been due to the financial collapse that took place around this time. With

TABLE 2. ODDS RATIO OF USING CONTRACEPTIVE METHODS AT COITARCHE BASED ON SOCIODEMOGRAPHIC CHARACTERISTICS

	1995		Odds ratio (95% CI)	p-value
	<i>Did not use contraceptive methods at coitarche</i> (n = 5744) n (%)	<i>Used contraceptive methods at coitarche</i> (n = 3885) n (%)		
Race				
White	3917 (57%)	2967 (43%)	(REF)	
Black	1533 (67%)	749 (33%)	1.02 (0.89, 1.18)	0.752
Other	294 (63%)	169 (37%)	0.62 (0.48, 0.80)	<0.001
Highest education				
Did not complete high school	1064 (66%)	552 (34%)	(REF)	
High school diploma	3357 (61%)	2144 (39%)	1.53 (1.26, 1.85)	<0.001
College diploma	1285 (53%)	1146 (47%)	1.96 (1.61, 2.39)	<0.001
Graduate degree	38 (47%)	43 (53%)	2.61 (1.90, 3.57)	<0.001
Annual family income				
<20,000 (reference)	1608 (66%)	816 (34%)	(REF)	
20,000–50,000	2130 (61%)	1339 (39%)	1.10 (0.94, 1.28)	0.230
>50,000	1536 (54%)	1297 (46%)	1.36 (1.16, 1.59)	<0.001
Missing ^a	470	433		
Religious importance				
Very important	3168 (64%)	1768 (36%)	(REF)	
Somewhat important	2080 (56%)	1616 (44%)	0.87 (0.72, 1.06)	0.165
Not important	493 (50%)	500 (50%)	0.97 (0.80, 1.17)	0.741
Missing	3	1		
2006–2010				
	<i>Did not use contraceptive methods at coitarche</i> (n = 1071) n (%)	<i>Used contraceptive methods at coitarche</i> (n = 4860) n (%)	Odds ratio (95% CI)	p-value
Race				
White	3917 (84%)	749 (16%)	(REF)	
Black	1533 (34%)	2967 (66%)	1.21 (1.00, 1.47)	0.052
Other	316 (25%)	947 (75%)	0.69 (0.58, 0.82)	<0.001
Highest education				
Did not complete high school	322 (27%)	890 (73%)	(REF)	
High school diploma	473 (17%)	2319 (83%)	1.71 (1.40, 2.09)	<0.001
College diploma	256 (14%)	1585 (86%)	2.25 (1.85, 2.74)	<0.001
Graduate degree	20 (23%)	66 (77%)	1.97 (1.43, 2.72)	<0.001
Annual family income				
<20,000 (reference)	371 (22%)	1284 (78%)	(REF)	
20,000–50,000	396 (19%)	1707 (81%)	1.23 (1.05, 1.45)	0.013
>50,000	304 (14%)	1869 (86%)	1.81 (1.46, 2.24)	<0.001
Missing ^a	0	0		
Religious importance				
Very important	529 (21%)	1951 (79%)	(REF)	
Somewhat important	292 (16%)	1561 (84%)	0.74 (0.62, 0.89)	0.001
Not important	51 (15%)	288 (85%)	0.98 (0.81, 1.19)	0.825
Missing	199	1060		

^aMissing includes respondents who refused to answer questions.

regard to the importance of religion, there was greater missing data in 2006–2010 (2359 women in 2006–2010 vs. 5 women in 1995). As the national trend toward less religious affiliation has been well documented,^{21,22} the increase in missing responses from 1995 to 2006–2010 could be a reflection of this trend.

With regard to sexual behaviors, a greater portion of women from 2006 to 2010 had coitarche at younger ages than women from 1995, with a majority of women experiencing coitarche at less than 21 years of age for both time frames. This is in contrast to published data that document a trend toward less premarital sexual activity in the US.^{23,24} Our

TABLE 3. ODDS RATIO OF USING CONTRACEPTIVE METHODS AT COITARCHE BASED ON SEXUAL AND CONTRACEPTIVE BEHAVIORS

	1995		Odds ratio (95% CI)	p-value
	<i>Did not use contraceptive methods at coitarche (n=5744)</i>	<i>Used contraceptive methods at coitarche (n=3885)</i>		
	n (%)	n (%)		
Age at coitarche				
<16	1520 (60%)	1010 (40%)	(REF)	
16–20	3373 (59%)	2371 (41%)	1.35 (1.17, 1.55)	0.000
>20	780 (62%)	478 (38%)	1.44 (1.16, 1.78)	0.001
Missing ^a	71	26		
Number of sexual partners				
1	1502 (60%)	1003 (40%)	(REF)	
2–5	2532 (58%)	1832 (42%)	1.14 (0.99, 1.31)	0.062
>5	1597 (62%)	993 (38%)	0.88 (0.75, 1.04)	0.130
Missing	113	57		
Type of contraception first used				
Barrier methods	1002 (27%)	2670 (73%)	(REF)	
Nonbarrier methods ^b	373 (31%)	818 (69%)	1.07 (0.92, 1.25)	0.351
Reliable methods ^c	4346 (92%)	379 (8%)	0.04 (0.04, 0.05)	<0.001
Other	13 (42%)	18 (58%)	0.30 (0.17, 0.53)	<0.001
Missing	10	0		
Source of first contraception				
Medical facility	572 (74%)	196 (26%)	(REF)	
Pharmacy	77 (18%)	345 (82%)	1.48 (1.11, 1.97)	0.007
School	5 (36%)	9 (64%)	1.26 (0.29, 5.38)	0.756
Spouse, partner, or friend	100 (15%)	545 (84%)	1.58 (1.22, 2.04)	<0.001
Other	25 (36%)	44 (64%)	0.16 (0.01, 1.67)	0.125
Missing	4965	2746		
2006–2010				
	<i>Did not use contraceptive methods at coitarche (n=1071)</i>	<i>Used contraceptive methods at coitarche (n=4860)</i>	Odds ratio (95% CI)	p-value
	n (%)	n (%)		
Age at coitarche				
<16	397 (21%)	1478 (79%)	(REF)	
16–20	514 (15%)	2905 (85%)	1.43 (1.22, 1.67)	0.000
>20	153 (25%)	454 (75%)	1.06 (0.82, 1.37)	0.670
Missing ^a	7	23		
Number of sexual partners				
1	229 (21%)	857 (79%)	(REF)	
2–5	386 (15%)	2139 (85%)	1.39 (1.15, 1.69)	0.001
>5	424 (19%)	1766 (81%)	1.03 (0.84, 1.27)	0.764
Missing	32	98		
Type of contraception first used				
Barrier methods	850 (17%)	4264 (83%)	(REF)	
Nonbarrier methods ^b	174 (27%)	476 (73%)	0.70 (0.57, 0.86)	0.001
Reliable methods ^c	39 (25%)	119 (75%)	0.56 (0.38, 0.82)	0.003
Other	0	0	0.04 (0.00, 0.29)	0.002
Missing	8	1		
Source of first contraception				
Medical facility	41 (20%)	160 (80%)	(REF)	
Pharmacy	38 (12%)	274 (88%)	1.16 (0.79, 1.71)	0.439
School	3 (10%)	29 (90%)	1.91 (0.56, 6.49)	0.297
Spouse, partner, or friend	119 (10%)	1038 (90%)	1.56 (1.21, 2.03)	0.001
Other	5 (12%)	37 (88%)	1.65 (0.98, 2.76)	0.057
Missing	865	3322		

^aMissing includes respondents who refused to answer questions.

^bIncludes methods such as withdrawal, rhythm method, and spermicidal agents.

^cIncludes hormonal methods and copper IUD.

results also suggest that despite the documented increase in the use of reliable contraceptives,²⁵ access to this form of contraception remains low at coitarche. This may also be why many women continue to rely on a spouse, partner, or friends as their sources of first contraception. The fact that 34% of women continue to obtain their first form of contraception from a nonmedical facility is troubling and may reflect why the first contraceptive is a not a reliable form, which is only available through a prescription. This highlights a need to increase access to reliable contraception for women less than 21 years of age.

Our results with regard to race and educational status show that most teen pregnancies are in Black and Hispanic women when compared to White women.²⁶ Given that Hispanic and Black teenagers are more likely to drop out of high school, our results highlight a need to provide early contraceptive education especially in this population. Nevertheless, our results also show that the *other* category shows a promising trend of a higher percentage using contraception at coitarche in 2006–2010, which was not the case in 1995. Multiple studies have shown that racial differences exist between contraceptive choices, likely due to contraceptive attitudes shared within an ethnic community.^{27–31} Our results similarly show varying contraceptive behaviors at coitarche based on racial background.

Income levels and contraceptive use at coitarche are trending in an appropriate direction. A higher percentage of women from all family income levels used contraception at coitarche in 2006–2010, whereas the opposite was true in 1995. In 1995, only women from family incomes of > \$50,000 were more likely than women from family incomes of < \$20,000 to use contraception at coitarche; however, in 2006–2010 women from family incomes of \$20,000–\$50,000 were also more likely to use contraception at coitarche than women at income levels < \$20,000. This may be reflective of educational efforts in lower socioeconomic communities.

In both 1995 and 2006–2010, girls <16 years old were least likely to use contraception at coitarche. When analyzing older women, in 1995 all age groups >16 year olds were more likely to use contraception at coitarche than <16 year olds; however, in 2006–2010 women >20 years old were less likely to use contraception at coitarche. It is important to note that women who had coitarche at greater than 20 years of age may represent women who are abstinent until marriage or those desiring a pregnancy. Therefore, this may represent a large subset of women who did not intend to use contraception at coitarche to become pregnant. Regardless, education on and easy access to contraception need to be directed toward young women, especially during the early teenage years, when exposure to sexual activity is high.

With regard to contraceptive method first used, our results show that women continue to more likely use barrier methods at coitarche, and that source of first contraception continues to be predominantly spouse, partner, or friends. This is concerning, given that a majority of reliable contraceptive methods, including long-acting reversible contraceptives, can only be offered at a medical facility. More effort needs to be focused on developing methods to make these medical facilities more accessible to the young population by either having more school-based health clinics that offer these methods, as the research has supported this for other adolescent health interventions.^{32–34} Other interventions could

include more medical facilities associated with retail stores or bringing contraceptive education outside of the medical realm and into the social realm, so that families and friends are educated simultaneously.

When interpreting this data it is important to note that the 2006–2010 database had proportionally more respondents in the *other* and black categories compared to the 1995 database. These trends represent the national trend of an increasing minority population; however, the NSFG sample is disproportionately representative of the black population (43%) when compared to the national percentage of black women in 2010 (12.6%).³⁵

There are a few limitations to our study. First, the cross-sectional nature of this study limits conclusions that can be drawn with regard to causal relationships. Second, some variables had a large number of missing data, especially for the source of first contraception in 2006–2010, for which 4229 women had not provided a response. Finally, the questionnaire relies on self-report, which results in an unavoidable recall bias.

In conclusion, it appears that there is room for improvement in increasing the number of women who use contraception at coitarche. Although more women have been progressively using contraception at coitarche, the disparity among different races and educational backgrounds seems to have widened. Women still use the less reliable barrier methods more frequently than more reliable methods at coitarche and obtain these methods from nonmedical facilities, a trend which has persisted since 1995. Efforts need to be focused on increasing access to reliable contraceptives for this vulnerable young population.

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