

# Contraception Adherence among East Harlem Adolescents

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## Abstract

**Objectives:** To determine the contraception adherence among an adolescent population of an inner city hospital.

**Methods:** In this retrospective, IRB approved study, the medical records of 100 de-identified patients presenting to Metropolitan Hospital for gynecologic and reproductive health care from January 2007 to December 2011 were evaluated. Data collected included race, age, gravidity and parity on presentation to the clinic, education level, method of payment, contraception methods utilized, obstetrical history and the side effects of the contraceptive method of choice. Data analysis was performed using SPSS software.

**Results:** Younger age was significantly associated with the use of multiple contraceptive methods ( $p=0.003$ ). The use of multiple contraceptive methods was associated with a higher pregnancy rate ( $p=0.008$ ). There was not a significant difference in the number of pregnancies between oral contraceptive users and Depot Medroxy Progesterone Acetate (DMPA) users ( $p=0.157$ ). None of the patients who used the Intrauterine Device (IUD) as contraception became pregnant during the study period.

**Conclusions:** Younger adolescents were found to be at greater risk for poor compliance with contraception, and as a result, had a higher number of new pregnancies than older adolescents. Prior studies have demonstrated that long acting reversible contraceptive methods are most effective for adolescents; however, nulligravid adolescents are often not prescribed these methods. Despite the limitations of a small sample size and retrospective review, this is a background for future research, and is representative of the patients of an inner city population.

**Keywords:** Contraception adherence; Adolescents; Contraception

## Introduction

The United States has one of the highest adolescent pregnancy rates among developed nations [1]. In 2006, among females ages 15 to 19 years, the pregnancy rate was 71.7 pregnancies per 1000 with approximately 41.9 births per 1000 females [2]. The teenage abortion rate in 2006 was 19.3 abortions per 1000 women. The Centers for Disease Control and Prevention (CDC) report that there have been declines in the teen birth rate since 1991 [3]. In 2009, despite a recent decline in the national teen birth rate to 410,000, that rate in the United States remains considerably higher than most other developed countries, that is, up to nine times higher than developed countries with the lowest rates [3,4].

The majority of adolescent pregnancies are unintended, which represents nearly half of the 6.7 million pregnancies reported in the United States [5]. This rate of 69 percent is even higher among 15- to 24-year old women [5]. Adolescent pregnancy can be detrimental both to individuals, as well as the nation of origin. Early childbearing has associated physical, emotional, and social risks [4]. In contrast to adults, adolescents are more at risk for low birth weight infants, preterm births, and the death of their children in infancy. Adolescent mothers are also more likely to have low school achievement and/or drop out of high school [3].

Children of teen mothers are also likely to perpetuate a cycle of disadvantage, and are more likely to give birth as teenagers themselves. More than 90 percent of teenagers who elect to give birth elect to raise their children [1]. Teen mothers are much less likely to finish high school, to remain unmarried, and to raise their children without a partner. Teen fathers are also less likely to finish high school and more likely to have low earnings [1]. Babies born to teen mothers are more likely to grow up with low socioeconomic status; live in single-parent households; and enter the child welfare system. Sons of teen mothers have a significant probability of incarceration as adults [1].

Medical risks include higher rates of maternal mortality, problems with the progression of labor and delivery, anemia, pregnancy-induced

hypertension, leading to low birth weight babies and prematurity [4]. Social and emotional outcomes for adolescent parents include poorer psychological functioning, and less stable employment than those from similar backgrounds who postpone childbearing [4]. Teen childbearing in the US costs taxpayers at least \$10.9 billion in 2008 [3]. Most of the costs are associated with negative consequences for the children of teen mothers, including increased costs for health care, foster care, incarceration, and lost tax revenue [3].

Almost half of high school students in the United States report having had sexual intercourse, ranging from 39 percent to 61 percent, depending on the state [4]. Nationally, among adolescents ages 15- to 19-years old, 46 percent have had sex at least once, and 70 percent have had sex by age 19 [3]. Sexual debut is reported by 32 percent of 9<sup>th</sup> grade students, 41 percent of 10<sup>th</sup> graders, 53 percent of 11<sup>th</sup> graders, and 62 percent of high school seniors [4]. In youth less than 13 years of age, 5.9 percent report having initiated sexual activity [4]. Early sexual debut, defined by authors Hartman et al., [3] as the onset of sexual intercourse at less than age 14 years, is associated with several negative reproductive health outcomes [4]. Young girls with early sexual debut are more likely to have significantly older male sexual partners, and multiple partners, which increases their risks of sexually transmitted infections and pregnancy [4].

According to the CDC, 12 percent of sexually active teenagers did not use any form of contraception at last intercourse [3]. Improvement

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in the accessibility of and compliance with contraceptive methods are important in order to reduce and curtail the incidence of unplanned pregnancy in adolescents [6]. Sexual decision making and pregnancy prevention in the early adolescent may be particularly challenging because of psychosocial, emotional, and cognitive immaturity [4]. There is an increase in pregnancy rates in middle adolescence, with an estimated pregnancy rate in 2005 of 40.2 per 100,000 among teenagers aged 15 to 17 years compared to 1.6 per 100,000 among teens less than 15 years of age [4]. In addition, late adolescents and young adults are highly likely to be sexually active with 86 percent of unmarried women ages 18 to 29 years of age reporting sexual activity. However, only half of these women report consistent contraceptive use [4].

In order to understand why teenagers who wish to avoid pregnancy become pregnant, the CDC analyzed data from the 2004-2008 Pregnancy Risk Assessment Monitoring System (PRAMS) [7]. This report describes the estimated rates of self-reported pre-pregnancy contraceptive use among Caucasian, African American, and Hispanic teen females aged 15-19 years with unintended pregnancies resulting in live births. 50.1 percent of these teens were not using any method of birth control when they got pregnant, and of these, 31.4 percent believed they could not get pregnant at the time. 21 percent used a highly effective contraceptive method. Less than 1 percent used one of the most effective methods, such as an intrauterine device; 24.2 percent used condoms; and 5.1 percent of teens used rhythm and withdrawal [7]. According to the Morbidity and Mortality Weekly Report in January 2012, in order “to decrease teen birth rates, efforts are needed to reduce or delay the onset of sexual activity, provide factual information about the conditions under which pregnancy can occur, increase teens’ motivation and negotiation skills for pregnancy

prevention, improve access to contraceptives, and encourage use of more effective contraceptive methods [8].”

In this retrospective study, an analysis of the factors influencing contraceptive adherence and use in an inner city, racially and ethnically diverse patient population, was conducted. This information will be applied to future research examining barriers to contraception use in order to determine which interventions may be applied to reduce teenage pregnancy rates.

## Materials and Methods

In this retrospective, IRB approved cohort study (L-10,718), the medical records of 100 de-identified patients, who presented to the Youth Health Corp clinic at Metropolitan Hospital Center from January 2007 to December 2011, were reviewed. Permission was obtained from the Institutional Review Boards of New York Medical College, Metropolitan Hospital, and New York City Health and Hospitals Corporation. Data collected included the following: race; age; gravidity and parity on presentation to the clinic; education level; method of payment; place of residence; contraception methods utilized; and obstetrical history.

The study consisted of adolescents between the ages of 13 and 21 years old. We compared contraception usage according to patient characteristics in order to determine which contraceptive methods were best adhered to and what factors were associated with poor contraceptive adherence. We described the use of multiple contraceptive methods as an indicator of poor adherence. The characteristics of patients that became pregnant during the study period were also examined.

Data analysis was done using SPSS software. The chi-squared test was used for categorical data. The Fisher’s exact test was used for small sample sizes. Continuous data that are normally distributed was analyzed using the student t-test. A regression analysis was used to evaluate for confounding variables.

## Results

Table 1 shows the demographics of our patients studied. The patients ranged in age from 14 to 21 years of age with an almost equal distribution of 52 percent of patients ages 14 to 17 years, and 48 percent of patients ages 18 to 21 years. The self-identified racial/ethnic distribution of patients included a majority of Hispanic patients (82 percent); 15 percent were African American; 2 percent were Asian; and 1 percent self-identified as other. The category of other was not specified further. In terms of parity at the time of presentation to the clinic, 34 percent of patients were nulligravid, 43 percent of patients were nulliparous, and 57 percent were multiparous. The method of payment for services in the clinic noted that there were no patients with private insurance. 89 percent of patients had Medicaid for insurance and 21 percent were self-pay.

In terms of education, 32 percent were graduates from high school, 22 percent had some high school education, and 18 percent had less than a high school education. 9 percent of patients attended some college, and 18 percent did not have an educational level noted in the medical record. Most of the patients, 45 percent, lived in Manhattan local to the hospital of study. 33 percent lived in the Bronx, 10 miles north of the hospital; 12 percent lived in Queens, 12 miles east of the hospital; and 7 percent lived in Brooklyn, 14 miles west of the hospital. 1 percent lived in Staten Island, 23 miles southwest of Manhattan across the New York Bay. 2 percent of patients lived outside of the New York City area.

Characteristic	No of patients (%)
Age	
14-17	52
18-21	48
Race/Ethnicity	
Hispanic	82
Black	15
Asian	2
Other	1
Parity	
Nulligravid	34
Nulliparous	43
Multiparous	57
Payment	
Private Insurance	0
Medicaid	89
Self-pay	21
Education	
Less than High School	18
Some High School	22
High School Graduate	32
College	9
Unknown	18
Residence	
Manhattan	45
Bronx	33
Queens	12
Brooklyn	7
Staten Island	1
Westchester	1

Table 1: Demographics of patients sampled.

Methods	No.	Mean Age	Standard Deviation
Multiple	49	16.6735	1.81874
One	51	17.7255	1.62577

\*P 0.003

**Table 2:** Patient adherence in relation to age.

Pregnancies (No.)	One Method No. (%)	Multiple Methods No. (%)	Total
3	0	1 (2%)	1
2	1 (2.0%)	3 (6.1%)	4
1	2 (3.9%)	12 (24.5%)	14
0	48 (94.1%)	33 (67.3%)	81
Total	51	49	100

\*P 0.008

**Table 3:** Number of new pregnancies in relation to patient adherence.

Patient characteristic	One Method No. (%)	Multiple Methods No. (%)	Total	
<b>Race</b>				
Asian	1 (2%)	1 (2%)	2	
Black	10 (19.6%)	5 (10.2%)	15	
Hispanic	39 (76.5%)	43 (87.8%)	82	
Other	1 (2%)	0	1	
Total	51	49	100	<b>* P 0.420</b>
<b>Parity</b>				
2	5 (9.8%)	4 (8.2%)	9	
1	28 (54.9%)	21 (42.9%)	49	
0	18 (35.3%)	24 (49%)	42	
Total	51	49	100	<b>*P 0.381</b>
<b>Education</b>				
College	3 (6.8%)	6 (15.8%)	9 (11%)	
High School	30 (68.2%)	24 (63.2%)	54 (65.9%)	
Less than High School	10 (22.7%)	7 (18.4%)	17 (20.7%)	
None	1 (2.3%)	1 (2.6%)	2 (2.4%)	
Total	44 (100%)	38 (100%)	82 (100%)	<b>* P 0.622</b>

**Table 4:** Race, Parity and Education in relation to patient adherence.

The contraceptive methods utilized by our patients included condoms, oral contraceptives, Depot Medroxy Progesterone Acetate (DMPA), vaginal contraceptive ring (NuvaRing) and the intrauterine device. 49 percent of patients used multiple contraceptive methods during the study period. Of the 9 patients whose initial contraception method of choice was the condom, one changed her method during the study period. 56 percent of the 34 patients that chose oral contraceptives upon enrollment in the clinic changed their method. 48 percent of the 42 initial users of depot medroxy progesterone acetate changed their contraceptive methods. 80 percent (4 out of 5) of NuvaRing users changed their method and 20 percent (1 out of 5) of the IUD users changed their method. On average, patients changed methods twice; however, 8 patients changed their method three or more times.

Younger age was significantly associated with the use of multiple contraceptive methods ( $p=0.003$ ) (Table 2). The use of multiple contraceptive methods was also significantly associated with a higher number of patients who became pregnant during the study period ( $p=0.008$ ) (Table 3). None of the patients who used the IUD as a method of contraception became pregnant during the study period. There were no nulligravid patients who used the IUD our study population. Regression analysis was performed to evaluate for an association with the use of multiple methods when controlling for confounders, and only

age was found to be statistically significant. In addition, a regression analysis was performed to evaluate for an association with pregnancy, and only age was found to be statistically significant (Table 2).

There was no significant association between race and method of contraception or use of multiple contraceptive methods ( $p=0.420$ ). There was no significant difference between parity and number of contraceptive methods used ( $p=0.381$ , Fisher's exact test  $p=0.2241$ ). Education level was not significantly associated with number of contraceptive methods ( $p=0.622$ ) (Table 4).

## Discussion

In this retrospective review, younger adolescents were found to be at greater risk for poor compliance with contraception, and used multiple methods of contraception. The use of multiple methods of contraception was associated with a higher number of new pregnancies while enrolled in the clinic. We found that the intrauterine contraceptive device, a Long Acting Reversible Contraceptive (LARC), was very effective at preventing pregnancies. For example, in a study by Zibners et al., [8] the continuation rates for levonogesterol implants were significantly higher as compared to DMPA and OCPs [9]. These authors quote continuation rates of 80.6 percent for the levonogesterol IUD and 75.6 percent for the copper IUD for teenagers ages 14 to 19 years old. Peipert et al., have similarly found that IUDs and sub dermal implants have the highest rates of satisfaction and 12 month continuation, and should be offered as the first line contraceptive methods [10].

Unfortunately, patients who had never become pregnant were not offered this LARC method. During our study, it was noted in several charts that IUDs were not available in the clinic. It is, therefore, plausible that due to the cost of LARC contraception and sometimes low availability that these devices were reserved for patients who had already had a pregnancy, and were older. Despite their proven effectiveness, safety and cost-effectiveness, LARC methods are not widely used in the United States. Only 5.5 percent of women taking contraceptives between the ages of 15 and 44 years use the IUD. Reasons for the lack of the use of these highly effective methods include patient's and provider's limited knowledge or attitudes towards the methods; practice patterns among providers; myths and misconceptions of the side effects; high initial costs; and provider biases [11].

Based on our results, we propose that IUDs and other LARC methods should be the primary method recommended to teenagers who are initiating sexual activity and are seeking contraception. Our study shows that younger patients are most at risk for unintended pregnancies; however, they are not offered the most effective methods.

Some of the limitations of our study are the small sample size and its retrospective nature. Based on the participation in the clinic, study lengths varied for different patients, so that patient enrollment did not occur simultaneously for patients. In addition, some information was missing from the medical records as this was dependent on provider documentation.

Males were also not evaluated in this study. However, there is a paucity of data on male attitudes and behavior regarding female hormonal contraception. Some research suggests that Latinas who disclosed and discussed contraceptive use with their partners were more likely to use an effective contraceptive method, indicating future research implications for the influence of male partners on female contraceptive choice [12].

The strengths of our study are that it is a representative sample of the patients in an inner city, which is reflective of an urban population

of a high population size. We surmise that where patients live in terms of distance from the hospital or clinic might influence access to contraception. However, this was not evaluated as a separate risk factor. This study provides a deeper understanding of the contraception management needs of this adolescent population, and provides the building blocks for future research. Our goals include a more complete chart review, including better use of electronic medical records, in order to analyze data. More subjects are to be recruited in order to complete a survey instrument evaluating the barriers to contraceptive usage. Finally, we seek to utilize and evaluate technology to help educate and promote compliance in our adolescent patients, including the use of social media, in order to affect intervention strategies.

## Conclusions

Improvement in, access to, and compliance with contraceptive methods are critical in reducing the rates of unplanned pregnancy among adolescents. Increased knowledge by patients, providers of contraception and male partners may influence contraception adherence. Future research goals include improved counseling of patients, especially younger patients about LARC methods. Currently, all patients who received an IUD had been previously pregnant, and did not become pregnant during the study period. Therefore younger, nulligravid patients would benefit from the LARC methods.

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