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Social Disadvantage as a Risk for First Pregnancy Among Adolescent Females in the United States

Krishna K. Upadhyia, MD, MPH¹ and Jonathan M. Ellen, MD²

¹Section of Adolescent Medicine, Department of Pediatrics, Georgetown University Medical Center

²Division of General Pediatrics and Adolescent Medicine Johns Hopkins School of Medicine

Abstract

Purpose—Differences in underlying determinants of pregnancy at different stages of adolescent development have implications for prevention strategies. We sought to determine whether social disparities in rates of adolescent pregnancy vary between early, middle and late adolescence. We hypothesized that as age increases, racial and socioeconomic disparities in rates of teen conception decrease.

Methods—Data were obtained from the National Survey of Family Growth Cycle 6. Outcome variables indicated whether respondents' had a first pregnancy at ages <15 years, 15–17 years, or 18–19 years. Independent variables were race and maternal education level. Logistic regression was used to calculate the relative odds of first conception in a given age range by race and maternal education level.

Results—The disparity in odds of pregnancy between black and white teens is maximal in early adolescence (OR <15years 3.89) and decreased by up to 40% in late adolescence (OR 18–19 years 2.01, $p < 0.01$). After stratifying by maternal education level, the same trends are seen.

Conclusions—In accordance with our hypothesis, we found that social disparities in pregnancy rates decrease between early and late adolescence. While pregnancy prevention efforts often target those at social risk including poor minority youth, fewer acknowledge and target the risks associated with development of sexuality in all teens. Efforts to better define the nature of healthy adolescent sexual development may lead to pregnancy prevention interventions focused on developmental risk that can apply to a wider set of adolescents.

INTRODUCTION

Adolescence is a period of considerable physical, cognitive and emotional development. It is likely that factors contributing to teen pregnancy exert differential pressure between early and late adolescence. Stated more plainly, the context in which a 13 year old becomes pregnant is likely to be quite different from that of the 18 year old experiencing the same event. In particular, we hypothesize that factors related to social disadvantage exert less influence in late adolescence as the capacity to form healthy romantic relationships

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Corresponding Author: Krishna K. Upadhyia, MD, MPH Assistant Professor of Clinical Pediatrics Section of Adolescent Medicine Department of Pediatrics Georgetown University Medical Center 3800 Reservoir Road, NW 2nd Floor PHC Washington, DC 20007 Phone: 202-444-8581 krishna.k.upadhyia@gunet.georgetown.edu.

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increases. Differences in underlying determinants of pregnancy at different stages of development have implications for pregnancy prevention strategies.

In the United States, social disadvantage impacting health has been associated with both low socioeconomic position (as measured by income, wealth and level of education) and with black race.[1,2,3,4] Although racial classification was historically built on the assumption of shared and distinct genetic heritage based on phenotypic characteristics such as skin color, we now know that race is overwhelmingly a social construction[5,6]. Scientific discoveries indicate that over 99% of the human genome is identical across individuals and differences that do exist are related to geographic ancestry which is only loosely correlated with race. [7,8] The historical use of racial classification systems to segregate and subordinate groups in US society however, has led to significant social disparities between racial groups. While often correlated with socioeconomic status, race adds dimensions such as discrimination including structural (eg. residential segregation) and personal discrimination that contribute to social disadvantage.[9,10,11] Changes in both racial and socioeconomic disparities in rates of pregnancy across ages of adolescence may therefore, be a clue that the relative contribution of social disadvantage to the etiology of teen pregnancy changes with age and development.

Racial disparities in rates of teen pregnancy and birth have been previously documented however, to our knowledge, no previous studies have examined how disparities in teen pregnancy rates change during adolescence. Using race (black vs. white) and maternal education as markers of social disadvantage, we sought to determine whether social disparities in rates of adolescent conception vary between early, middle and late adolescence. We hypothesized that as age increases, racial and socioeconomic disparities in rates of teen conception decrease.

METHODS

Data were obtained from Cycle 6 of the National Survey of Family Growth (NSFG). The NSFG is a cross sectional survey conducted by the Centers for Disease Control (CDC) to collect data related to pregnancy and reproductive health in a nationally representative sample of women and men of reproductive age. In order to ensure adequate representation, the NSFG over samples certain populations including teens and those of black race. Complete details about the study design and methods have been previously described.[12] This analysis was restricted to all female respondents in NSFG Cycle 6.

Outcome Variables

National pregnancy rate data are available by age and race, however those data are estimates based on (1) number of live births, (2) abortion data and (3) estimates of fetal losses from pregnancy data collected in the NSFG. We elected therefore to use women's self report of first conception directly from the NSFG as our pregnancy measure. The outcome of interest for this analysis was based on the NSFG variable "Age at first conception". The variable was re-coded to create three dichotomous variables indicating whether the respondent had a first pregnancy (yes vs. no) at ages <15 years (early adolescent), 15–17 years (middle adolescent), or 18–19 years (late adolescent). Women could be included in more than one age group, i.e., as a women aged she was included in the next age group. However, once a woman reported becoming pregnant she was not included in any other age group.

Independent Variables

Because those whose racial identity is black are subject to social discrimination regardless of their ethnic/cultural identity, we chose to use racial categories as our independent variable

and not to subdivide racial groups, ie. White non-hispanic, black non-hispanic and Hispanic, as is more commonly done in national reporting of pregnancy/birth data. The NSFG variable RACE classifies participants as “Black”, “White”, or “Other”. Our hypothesis centers on black/white disparities as a historical marker of social disadvantage and we therefore excluded participants characterized as “Other” for this analysis. Those participants who characterized their ethnicity as Hispanic, a separate question in the NSFG, are included in each racial group, depending on their self classification.

As a measure of the socioeconomic status of the respondents as adolescents, we used their report of their mother's highest level of education. This was coded as a three level variable: less than high school, high school diploma or GED, more than high school.

Covariates

To account for the different generational cohorts in the dataset, regression analyses were adjusted for the respondents' age at the time of interview.

Data Analysis

Descriptive statistics were calculated to assess the population and subgroup sizes. Within each age category of interest and level of maternal education, the percent with and without first conception was calculated by race. Logistic regression was used to calculate the odds of first conception in a given age range by race and level of maternal education. Regression analyses were adjusted for the respondents' age at the time of interview. Wald tests were used to test for significant differences between odds ratios across models. Data were analyzed using STATA version 10.0 (StataCorp, College Station, TX). All analyses were conducted with the survey commands in STATA using sample weights as recommended by CDC in order to appropriately account for the complex sampling design of the NSFG including oversampling of certain populations that was previously noted.[13]

RESULTS

A total of 7, 643 women ages 15–44 participated in the NSFG and were eligible for inclusion in this study (Table 1). The weighted mean age of participants was 30 years old. The weighted percentage of the sample that classified their races as black was 15.1%. Six hundred eighty-one (8%) women had their race classified as “Other” and were excluded from the analysis. The weighted percentage of the total sample that indicated their ethnicity was Hispanic/Latin was 14.8% including 7.5% of those that classified themselves as having black race and 14.2 percent of those classified as white race.

A small proportion (weighted estimate 2.5%) of the total population of women reported a first conception before the age of 15. An additional 14.2% reported a first pregnancy between ages 15–17 and 16.6% reported a first pregnancy at age 18 or 19.

Analyses indicate that the rates of pregnancy within each racial group increase from early to late adolescence (Table 2). Overall, rates of pregnancy are higher in each maternal education category among black, compared with white women. Rates of pregnancy are also highest among those who report their mother has less than a high school education and lowest among those whose mother has more than a high school education.

Using logistic regression to compare the relative odds of pregnancy between racial groups, the data indicate that the disparity in odds of pregnancy between black and white teens is maximal in early adolescence (Black/White OR in <15year 3.89) and is decreased by up to 40% in later stages of adolescence (OR 18–19 years 2.01, $p<0.01$). After stratifying by maternal education, the same trends are seen within strata (Table 2) although the decrease

only reached statistical significance among the group with the lowest level of maternal education (OR < 15 years 2.0, OR 18–19 years 1.3, $p=0.04$).

While overall rates of pregnancy are lowest among women who report their mother has more than a high school education, the data suggest that the black/white disparity in teen pregnancy rates is higher in this group compared with both other education levels (Table 3).

DISCUSSION

The goal of this paper was to explore whether social disadvantage, as measured by both race and socioeconomic status, contributes differentially to risk of first pregnancy at different stages of adolescence. In accordance with our hypothesis, we found that social disparities in pregnancy rates decrease between early and late adolescence. This decrease is consistent with recently published CDC birth rate data.[14]

Our findings suggest that factors related to social disadvantage contribute relatively more to teen pregnancy rates in early adolescence than they do in later adolescence. The results also suggest that risk for pregnancy among older adolescents is more generalized and may, therefore, be related to a developmental process. It is well established that rates of sexual activity among teens in the United States increase between early and late adolescence and that a majority of teens report sexually debut by age 19.[15,16] The majority of teen pregnancies also occur among 18–19 year olds. This is strong evidence that sexual curiosity and activity are expected during mid to late adolescence and may result in adverse outcomes, including unintended pregnancy, if not explored safely. Declines in pregnancy among 18–19 year olds since 1990 have been modest, compared with those in the younger groups of teens.[17] This may be due to the failure of our teen pregnancy prevention approaches to understand the different factors that may contribute to pregnancy among older compared with younger teens.

Although the data suggest that social disparities decrease during adolescence, disparities do exist at each stage and must be addressed. Reasons why teens from disadvantaged backgrounds might be at risk for early sexual activity and pregnancy include family, educational and peer influences along with neighborhood characteristics.[18,19,20] Ongoing efforts to understand and target interventions to decrease disparities in teen pregnancy are necessary.

Our findings should be considered in light of general limitations. Our outcome measure is based on self report of first pregnancy and is therefore subject to recall and reporting bias. It is well documented that abortions are underreported by women in the NSFG[21, 22]. This makes its use as a data source for abortions and unintended pregnancy as defined by the outcome of terminated pregnancy problematic. It is less clear from previous studies how women's reluctance to report the outcome of abortion affects their report of their number of pregnancies which is the target of this analysis. We felt it was important to use pregnancy as our outcome for this analysis because there are many additional factors that intervene between a pregnancy diagnosis and the outcome of birth or termination that could confound our association of interest.

An additional limitation of this study is that age and development are not directly correlated. Our analysis looks at overall trends and cannot account for variation in development of individuals in the sample. Finally, maternal level of education is only a limited measure of socioeconomic status. Given the age range of participants at the time of the interviews however, we felt it was the best measure within the dataset to capture the respondent's socioeconomic status during adolescence. We do recognize however, that use of an alternate measure such as family income may have yielded different results.

While pregnancy prevention efforts have often targeted those at social risk including poor minority youth, fewer efforts have acknowledged and targeted the risks associated with the expected development of sexuality among all teens. Looking at risk through a developmental lens requires an expansion of pregnancy prevention strategies to focus on ways to manage sexual feelings and activity safely. Examples of such interventions may include changing clinical practice guidelines or provide revaluation measures to incentivize earlier and more widespread use of highly effective contraception. Efforts to better define the nature of healthy adolescent sexual development may lead to pregnancy prevention interventions focused on developmental risk that can apply to a wider set of adolescents.

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Table 1

Selected Weighted Population Characteristics for Female Participants in Cycle 6 of NSFG (n=7643)*

Age (mean, 95% CI)	29.97 years (29.6, 30.3) Range 15–44 years
Race (95% CI)	
Black	15.1% (13.6, 16.6)
White	76.5% (74.7, 78.3)
Other	8.4% (7.5, 9.4)
First Conception Age ≤14 years (95% CI)	2.49% (2.08, 2.98)
First Conception Age 15–17 years (95% CI)	14.2% (13.01, 15.48) **
First Conception Age 18–19 years (95% CI)	16.61% (15.05, 18.3) ***

* population size based on weighting of sample size N=61,560,747

** N= 60,028,967

*** N= 46,098,461

Table 2
Weighted Percentage (95% CI) of Women Reporting 1st Pregnancy by Age and Race, Stratified by Maternal Level of Education

	Mom less than high school education			Mom high school education			Mom more than high school education		
	1 st pregnancy under age 15	1 st pregnancy age 15–17	1 st pregnancy age 18–19	1 st pregnancy under age 15	1 st pregnancy age 15–17	1 st pregnancy age 18–19	1 st pregnancy under age 15	1 st pregnancy age 15–17	1 st pregnancy age 18–19
Black	8.2% (5.3, 12.4)	26.6% (21.1, 32.9)	31.6% (24.9, 39.1)	6.8% (4.8, 9.7)	26.3% (20.8, 32.7)	24.8% (19.6, 30.8)	4.3% (2.4, 7.8)	17.7% (14.5, 21.4)	21.5% (16.7, 27.3)
White	2.1% (1.3, 2.4)	21.0% (17.7, 24.7)	21.9% (18.8, 25.5)	2.4% (1.6, 3.5)	12.8% (10.8, 15.0)	17.1% (13.6, 21.2)	0.8% (0.4, 1.4)	7.6% (6.1, 9.4)	9.8% (7.9, 12.1)

Table 3

Relative Odds of 1st Pregnancy by Age for Black Compared with White Respondents, Stratified by Maternal Level of Education

	O.R. * 1 st Pregnancy under age 15 (95% CI)	O.R. 1 st Pregnancy age 15–17 (95% CI)	O.R. 1 st Pregnancy age 18–19 (95% CI)
Total	3.9 (2.7, 5.6)	2.2 (1.8, 2.7)	2.0 (1.6, 2.5)
Mom less than high school education	2.0 (1.4, 2.9)	1.2 (1.0, 1.4)	1.3 (1.0, 1.6)
Mom high school education	1.7 (1.3, 2.3)	1.6 (1.3, 1.9)	1.3 (1.0, 1.5)
Mom more than high school education	2.4 (1.6, 3.8)	1.6 (1.4, 2.0)	1.6 (1.3, 2.0)

* Black/White Odds Ratio controlling for respondent's age at the time of interview