Sexual and Fertility Behaviors of American Females Aged 15–19 Years: 1985, 1990, and 1995

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A B S T R A C T

Objectives. This study characterized changes in sexual and reproductive behaviors from 1985 through 1995 among American females aged 15 to 19 years and related these changes to family factors.

Methods. Nationally representative sample survey data from the 1995 National Survey of Family Growth were analyzed with Weibull hazards models of age at first intercourse and first pregnancy and with logistic regression models of contraceptive use at first intercourse and pregnancy outcome.

Results. Improvements in the family socioeconomic situations of young women have lessened the risk of teen motherhood, while changes in family structure have increased the risk. Young women whose parents have more than a high school education, who live with both parents, and who attend church delay the timing of first sexual intercourse and are more likely to use a contraceptive.

Conclusions. The trend of increases in teenage motherhood has ended owing to a halt in increases in the proportion of sexually active young women and substantial improvement in contraception, with the greatest improvements among those from advantageous family situations. (*Am J Public Health*. 2000;90: 1421–1425)

Childbearing among teenagers continues to be an important topic of public health concern. There has been considerable research on the medical, social, and economic consequences of adolescent childbearing. Although some research has suggested that the adverse consequences of teenage childbearing are overstated, most evidence still indicates that teenage mothers are worse off in many ways than women who delay childbearing.[1,2]

From 1960 to 1992, the number of births to unmarried women aged 15 to 19 years quadrupled and the birth rate to unmarried women in this age group tripled.[3] A reversal of these historic patterns after 1992 has been documented, with modest declines in the number and rate of births among teenagers in the United States.[4] This recent change in teen birth rates is due to a stabilization in the early initiation of sexual intercourse and a greater use of contraceptives at first intercourse, especially of condoms.[5]

Those studies noted that these changes are likely associated with shifts in the behaviors of Blacks, Whites, and Hispanics and in the overall ethnic composition of adolescent women, but they did not systematically analyze these patterns.[4,5] Neither has prior research considered recent trends in adolescent fertility behaviors and outcomes as these relate to the changing family life experiences of young women. The goal of this study was to perform such an analysis to document and explain recent changes in adolescent fertility behaviors.

The last 3 decades have witnessed a dramatic increase in the number of single parents in American families.[6,7] By 1994, more than 30% of all parent–child living arrangements were accounted for by single-parent families. In prior research, single motherhood has generally been defined as the experience of a single-mother family living arrangement at a specific age.[8] However, this specification lumps together families that have been headed by a single mother since the birth of the child, those that were headed by a single mother at the time of the child's birth but in which the mother later remarried, and those in which parents were initially married but later separated. It is important to distinguish between these types of family dynamics in modeling the effects of single-mother parenthood on adolescent sexual behavior, because they may have distinct impacts on adolescent sexual and reproductive behaviors. It also has been argued that it is instability in the family structure over the course of the child's life, not just the form of that structure at critical stages of the life cycle, that is problematic for the socialization of children as responsible adolescents who are able to make appropriate judgments about fertility behaviors.

One reason offered for the association of single-mother families with high rates of teenage fertility is the difficulty of parental supervision.[9] The expectation is that households with at least 2 adults are better able to supervise the behaviors of teenage daughters and to control their exposure to risky situations. Maternal participation in the labor force may reduce the amount of time a mother is available to supervise her children.[10] A related variable that indicates the lifestyle of the family and that often is associated with its beliefs about premarital sexual behavior is the church attendance of adolescents.

Methods

Data

The data for this study comes from the National Survey of Family Growth—Cycle V (NSFG), which was designed and administered

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by the National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention. A representative sample of 10 847 noninstitutionalized women aged 15 to 44 years were interviewed from January through October 1995.[11] Data were collected on each participant's sexual activity, contraceptive usage, pregnancy if applicable, childhood living situations, and other demographic and economic characteristics.

A variety of individual characteristics and factors in a study design are known to affect the reliability and validity of retrospective survey data; these generally include the salience of the questions, the recency of the event of concern, the racial/ethnic and socioeconomic characteristics of the population, and the mode of interview.[12–14]

The 1995 NSFG revolutionized the collection of fertility data by adopting many new methods that dramatically reduced response error; these included the use of computer-assisted interviewing, which allowed interviewers to tailor questions to individual respondents and to immediately detect impossible or inconsistent responses, which could be corrected during the interview. The survey collected life history data in various life domains; this approach has proven exceptionally sound for the collection of complete and accurate retrospective information. Because sensitive matters were integrally placed within questions about the overall life history, they were less subject to response bias or refusal.

The difficulty of obtaining full and accurate reporting of abortion information is still a direct challenge to the integrity of survey research. A recent study on abortion underreporting in the 1995 NSFG indicated that errors in abortion reporting were somewhat reduced by the use of both self-reports and personal interviews but that the survey retained systematic patterns of underreporting.[15] Other studies have suggested that such reporting errors generally do not affect the direction or magnitude of most predictor variables, even though they systematically lead to underreporting.[14,16] To minimize the problem with abortion reporting in this study, we considered in our multivariate analysis the likelihood that a pregnancy results in a live birth but we did not break down alternative outcomes into abortion or other types of pregnancy loss.

The only major problems with reporting errors that we encountered in this study were the rare, but troublesome, inconsistencies in dates of first sexual intercourse and conception.[17] In this study, calendar dates of first pregnancy are inconsistent for 8.6% (n=75) of those who had become pregnant by 19 years of age, with exact date of conception preceding the reported date of initiation of sexual activity. We replaced the inconsistent date of first pregnancy by using instrumental variables (age of the respondent at the time of interview and date of initiation of sex) that were independent of the variables of interest in this report.

Research Design

To analyze trends in the sexual activity of teenage girls, we grouped the respondents into 3 cohorts aged 15 to 19 years at 3 distinct periods: 1985 (born 1966–1970); 1990 (born 1971–1975); and 1995 (born 1976–1980). We used the retrospective event history data to reconstruct the fertility behaviors of the young women in these calendar years.

The complex sampling design of the NSFG was taken into account in the calculation of standard errors via SUDAAN, a statistical package recommended by the NCHS for their study.[18,19] This analysis was based on 4653 sample cases representing 27.6 million young women aged 15 to 19 years.

Statistical Model

The dependent variables in the analysis are as follows: (1) the risk of young women becoming sexually active between the ages of 12 to 19 years, (2) the hazard of pregnancy among sexually active teenagers, (3) the probability of contraceptive use during first intercourse (among those ever sexually active), and (4) the probability of a live birth's resulting from first pregnancy among those becoming pregnant by 19 years of age.

A Weibull hazards regression model was used to estimate the timing of first sexual intercourse and the timing of first pregnancy among sexually active teenaged girls. Diagnostic plots (not shown) demonstrate that the distribution of survival time is well described by the Weibull distribution.[20,21] The log-hazard form is

$$\log[h(t)] = \alpha \log(t) + \beta_0 + \beta_1 x_1 + \ldots + \beta_k x_k,$$

where h(t) is the hazard of the event and $x_1 \ldots x_k$ are covariates. Period of risk begins at 12 years of age in this model and is censored at the time of observation (1985, 1990, or 1995), when the respondent is no older than 19 years.

Logistic regressions were used to estimate the probability of contraceptive use at time of first sexual intercourse and the outcome of the first teenage pregnancy (live birth vs other).

Measurement of Family Life Experiences

Key aspects of single-mother living arrangements were measured by 2 variables: (1) the cumulative proportion of time a respondent lived in a single-mother household up until the time of risk (i.e., 12 years of age) and (2) parental marital status at the time of the respondent's birth. Potential for parental supervision at the time of risk was measured by 2 variables: the presence of parents and parent-surrogates and the mother's employment status at the time of risk. Family instability was measured by the number of family structure living arrangements experienced from birth to the time of risk.

Race/ethnicity included 3 categories: non-Hispanic Black (labeled "Black"); non-Black Hispanic (labeled "Hispanic"); and non-Black, non-Hispanic (labeled "White").

The socioeconomic status of the household was measured by the highest level of education of the parent or parent-surrogate living in the household. Church attendance was indicated by whether the respondent attended church at least once per month when she was aged 14 years. Metropolitan/nonmetropolitan residence in 1995 was used as a crude proxy of residence during adolescence.

Results

From 1985 to 1995, there were notable trends in the early life experiences of adolescent girls that affected their sexual and reproductive experiences (Table 1). There was a 10% increase (to 54% in 1995) in the percentage of those with a parent with more than a high school education. The percentage of mothers who were not employed outside of the home declined from 37% to 24%. Church attendance at 14 years of age was unchanged.

There was a 5% decline in the proportion of adolescents whose parents were married at the time of the adolescent's birth. This change resulted from a substantial increase in the likelihood that the parents were cohabiting instead of married. The percentage of young women who experienced more than 1 family living arrangement increased from 32% to 43%. Even more indicative of unstable family life was the increase from 16% to 24% in the proportion of young women experiencing 3 or more parental living arrangements. Those living in a household with both biological parents at the time of risk of sexual activity declined from 66% in 1985 to 54% in 1995. One half of this decline in households with both biological parents was accounted for by the increase in the percentage of households in which only the mother was present; the rest was associated with an increase in the percentage of households in which 1 parent and another adult (typically a stepparent) were present.

Family life experiences had strong, systematic relationships with teenage fertility behaviors (Table 2). Adolescents whose parents were better educated were 28% less likely to initiate sexual intercourse and 52% more likely

TABLE 1—Birth Cohort Change (% Distribution) in Early Life Experiences Affecting Sexual Activities and Fertility of Women Aged 15–19 Years

Covariate	Birth Cohort (Year of Observation) 1966–1970 (1985)	1971–1975 (1990)	1976–1980 (1995)
Race/ethnicity			
Black	13.9	14.6	15.6
Hispanic	12.7	12.8	12.8
White	73.5	72.7	71.6
Residence*			
Metropolitan	81.0	80.3	76.3
Nonmetropolitan	19.0	19.7	23.7
Parents' education,* y			
≤12	56.3	48.4	45.9
>12	43.7	51.6	54.1
Church attendance			
Yes	84.2	81.9	83.6
No	15.8	18.1	16.4
Time in single-mother family,* %			
<50	92.2	90.3	86.8
≥50	7.8	9.7	13.2
Parents' marital status at birth*			
Married	89.4	85.8	84.4
Unmarried but cohabiting	2.6	4.2	6.1
Not together	8.1	10.0	9.5
Current family structure*			
Both biological parents	65.7	62.0	53.8
Parent and stepparent	10.1	11.8	14.5
Single parent and others	3.3	3.2	5.1
Single parent	17.6	18.9	23.6
No parent	3.4	4.0	3.0
Mother's employment status*			
Full-time	44.0	48.3	50.9
Part-time	19.4	20.0	25.2
Not working	36.6	31.8	23.9
Number of living arrangements since birth*			
1	67.8	65.0	56.7
2	16.5	15.8	18.9
3	8.6	10.8	13.3
4	2.9	5.5	6.3
5 or more	4.2	3.0	4.8
Sexually active*	44.7	51.3	51.1
Contraceptive use*	58.4	65.4	78.7
Pregnancy of sexually active	30.9	31.5	31.7
Outcome of first pregnancy*			
Live birth	56.6	63.5	61.2
Other	43.4	36.5	38.8

*$P < .05$ in χ^2 test for difference in composition across cohorts.

to use a contraceptive at first intercourse. However, all of the other intercohort trends in family life experiences led to increased risk of sexual intercourse and lower likelihood of contraceptive use.

Despite the growth of alternative living arrangements, the major distinction in family life experiences was between families with both biological parents and all other family structures. For example, adolescents whose parents were cohabiting at the time of the child's birth were 42% more likely to be sexually active than those whose parents were married. Regarding current family structure, daughters in alternative living arrangements were at least 30% more likely to be sexually active than those in families with both biological parents. The number of living arrangements was positively associated with the likelihood of being sexually active. The percentage of an adolescent's lifetime spent in a 1-parent family (treated as a continuous variable in the model) had no impact on fertility behaviors.

Daughters of mothers who did not work outside of the home had rates of first intercourse that were 24% lower than those among daughters whose mothers worked full-time. However, the rate at which adolescents used contraceptives at first intercourse was not affected by whether the mother worked full-time or part-time. Regular church attendance at 14 years of age was associated with an approximately 29% lower rate of initiation of sexual activities and a 58% greater likelihood of using a contraceptive at first intercourse.

Daughters of nonworking mothers and daughters experiencing more than 1 living arrangement were more likely to become pregnant, even when they were similar in contraception use at first intercourse.

Among those who became pregnant, the daughters of better-educated parents were less likely to bring the pregnancy to term. More family living arrangements were associated with a lower likelihood of a live birth. Other aspects of family experiences did not affect the outcome of the pregnancy; instead, the major impact of these variables was on sexual activity and contraception.

Period increases in the rate of first sexual intercourse existed even when all of these family factors were taken into account, so the increase in rates of early initiation of sex observed in recent years cannot be attributed solely to deterioration in the family experiences of recent cohorts. However, the increase in early sexual activity reached a peak among adolescent girls born in the early 1970s (who became sexually active in the late 1980s and early 1990s). The most dramatic recent change was in the increased likelihood that girls used a contraceptive at first intercourse. This has been paralleled by a significant decline in the likelihood of pregnancy from 1985 to 1995.

Blacks had rates of initiating sexual intercourse that were one quarter higher than those of Whites or Hispanics. On other dimensions of adolescent fertility, it was the Whites who were distinctly different—they were more than twice as likely to use a contraceptive, less than half as likely to become pregnant, and about half as likely to end a first pregnancy with a live birth. These racial/ethnic differences control for the effects of socioeconomic aspects of family life and differences in family structure. Notably, the consequences for sexual activity and fertility were identical for adolescent girls from different ethnic groups who experienced identical family structures and family lifestyles.

Discussion

These results indicate a virtual revolution in adolescent fertility experiences in the United States between 1985 and 1995. In 1985, 45% of adolescent girls aged 15 to 19 years were sexually active and just over half used a contraceptive method at first intercourse. By 1995, the initiation of sexual intercourse occurred slightly earlier, so that 51% of all young women aged 15 to 19 were sexually active and more

TABLE 2—Models of Net Effects (Odds Ratios) of Early Life Experiences on Sexual Activity and Fertility of Women Aged 15–19 Years

Covariate	Sexually Active	Contraceptive Use	Pregnancy	Live Birth
Birth cohort (year of observation)				
1966–1970 (1985)	0.811***	0.334***	1.232*	0.736
1971–1975 (1990)	0.970	0.460***	1.176	1.125
1976–1980 (1995)	1.000	1.000	1.000	1.000
Race/ethnicity				
Black	1.258***	0.438***	1.783***	1.787**
Hispanic	1.047	0.310***	2.315***	1.911**
White	1.000	1.000	1.000	1.000
Residence				
Metropolitan	0.996	1.102	1.105	0.678
Nonmetropolitan	1.000	1.000	1.000	1.000
Parents' education, y				
>12	0.715***	1.515***	0.791***	0.570***
≤12	1.000	1.000	1.000	1.000
Church attendance				
Yes	0.708***	1.579***	1.011	1.285
No	1.000	1.000	1.000	1.000
Time in single-mother family, %	1.000	0.998	1.000	1.003
Parents' marital status at birth				
Unmarried but cohabiting	1.417***	0.874	1.174	0.972
Not together	1.261***	1.137	1.094	0.906
Married	1.000	1.000	1.000	1.000
Current family structure				
Parent and stepparent	1.325***	0.882	0.887	1.255
Single parent and others	1.481***	0.623	1.008	0.778
Single parent	1.353***	1.009	0.995	1.054
No parent	1.301*	1.058	1.039	0.926
Both biological parents	1.000	1.000	1.000	1.000
Mother's employment status				
Part-time	0.874*	1.000	0.998	0.908
Not working	0.755***	0.934	1.344***	1.245
Full-time	1.000	1.000	1.000	1.000
Contraceptive use at first intercourse				
Yes	. . .	. . .	0.628***	. . .
No			1.000	
Number of living arrangements	1.040*	0.970	1.114**	0.823 *
Log likelihood	–3694.0	–1432.5	–2280.7	–464.4
Sample size	4653	2392	2392	876

Note. Weibull hazards model is applied for both sexually active and pregnancy; logistic regression is applied for contraceptive use; logistic regression is applied for the outcome of first pregnancy (live birth vs other), with other as the reference category.
*$P<.05$; **$P<.01$; ***$P<.001$.

than three quarters used a contraceptive method at first intercourse. Although the data must be interpreted cautiously, it appears that when a pregnancy occurred in 1985, one third of these adolescent girls chose to have an abortion. By 1995, abortion was used to terminate only one fifth of the pregnancies that occurred among adolescent girls. This is consistent with evidence from abortion service statistics on trends in the overall abortion rate and use of abortion services.[22]

This represents a shift in the behavior of young American women toward an earlier, but more planned, initiation of sexual activity. The increased use of contraceptives was due in large part to significant increases in the use of condoms for protection against both pregnancy and disease.[3,23,24] The reduction in rates of abortion may relate to a reduced preference for abortion as a way to resolve pregnancy or to more limited access to abortion.[3,25,26] However, it does not seem to be due to a shift in the composition of pregnancies to include more Hispanics, who are more likely to carry a pregnancy to term. What is especially noteworthy is that this revolution in adolescent fertility experiences occurred despite the increasingly unfavorable early family life experiences of successive cohorts of American women. It is likely that the emphasis of public health programs and adolescent education programs has led to this secular increase in condom use.[27]

The leaders in this shift in the reproductive regime of adolescent girls were those who were born and raised in families with both biological parents and had a college-educated parent. Thus, the family experiences predictive of socioeconomic success (higher educational attainment, higher-quality job, and above-poverty-level income) were associated with a reproductive regime that is in turn associated with a more auspicious transition to adulthood. This results in further advantages for young women from favorable family origins.

It is clear that family structure has a large and persistent influence on adolescent fertility behaviors. Being born and growing up in a family with both biological parents is the key to delayed sexual intercourse. Whether the family is headed by only the mother or includes 2 adults but not the father, the outcome is the

same—an increase in the likelihood of early sexual intercourse. The effect of family structure thus appears to be associated with direct exposure to nontraditional family living arrangements. Instability in family living arrangements leads to less favorable adolescent fertility behaviors, even when family structure is controlled for. This effect will be increasingly important as a growing share of adolescents experience instability in their parental structures. Maternal cohabitation is a particularly negative environment for young women with regard to initiation of sexual behaviors and the likelihood of pregnancy.

This lack of support for the supervision aspects of family structure must be qualified by noting that the effects of maternal employment—which is an indirect measure of the amount of time the mother has—are potentially directly involved in one-on-one contact with and supervision of the daughter. In this case, greater maternal employment, implying less one-on-one contact and supervision, is associated with a higher rate of sexual activity in adolescents.

Continued improvements in contraceptive education will be essential for the reproductive health of American adolescents as the characteristics of the family structures in which they live become increasingly unfavorable. At the same time, because it is young women from favorable socioeconomic origins who most often receive contraceptive education, the socioeconomic and family structure differentials in fertility behaviors are likely to widen in the future. □

Contributors

D. P. Hogan, the principal investigator under the grant that supported this work, planned the study and wrote the introduction and the Results and Discussion sections. R. Sun conducted statistical analyses and drafted the Methods section. G. T. Cornwell, as coinvestigator, developed the analysis plan for this study and contributed to the writing of the paper.

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