Age of sexual debut among US adolescents☆

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Abstract

Background—This study examined gender and racial/ethnic differences in sexual debut.

Study Design—We analyzed 1999–2007 data from the Youth Risk Behavior Surveillance System (YRBSS), a cross-sectional, nationally representative survey of students in Grades 9–12 established by the Centers for Disease Control and Prevention. The Kaplan–Meier method was used to compute the probability of survival (not having become sexually active) at each year (age 12 through 17), and separate estimates were produced for each level of gender and racial/ethnic group.

Results—African-American males experienced sexual debut earlier than all other groups (all tests of significance at p<.001) and Asian males and females experienced sexual debut later than all groups (all tests of significance at p<.001). By their 17th birthday, the probability for sexual debut was less than 35% for Asians (females 28%, males 33%) and less than 60% for Caucasians (58% females, 53% males) and Hispanic females (59%). The probability for sexual debut by their 17th birthday was greatest for African Americans (74% females, 82% males) and Hispanic males (69%).

Conclusions—These results demonstrate a need for sexual education programs and policy to be sensitive to the roles of race and ethnicity in sexual debut.

Keywords

Sexual debut; Adolescent risk behaviors; Sexual intercourse; Sexual differences

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1. Introduction

First sexual intercourse, or sexual debut, is a normal part of human development. The proportion of high school students who were sexually active has remained steady since 1997, approaching nearly 50% for all high school students with almost 70% of youth experiencing sexual debut by age 18 [1–3]. Approximately 7.1% of American youth report sexual debut prior to 13, with more male than female youth reporting early sexual debut; by age 16, approximately 30% of females and 34% of males have had sexual intercourse [1,4].

Examining differences in sexual debut across racial/ethnic groups is important to improve understanding on the effects of culture on sexuality. A vast amount of published data has already examined sexual debut and the data suggests that African Americans tend to initiate sexual intercourse at an earlier age than Caucasian, Hispanic and Asian youth, while Asians experience sexual debut at a later age when compared with these racial/ethnic groups [5–6]. However, most of the findings are based on community and/or convenience samples with relatively few studies utilizing nationally representative samples that support generalization [7]. In fact, no studies with sample sizes large enough to sufficiently characterize and compare sexual debut across these four major racial/ethnic groups in the general population were found in the existing literature within the last 10 years. This is particularly true for Asians due to the small sample of this population in national data systems. To better inform culturally appropriate sexual health education and health promotion programs, we seek to extend previous research by using 1999–2007 data from the National Youth Risk Behavior Survey (YRBS) to compare patterns of sexual debut in adolescents across gender and racial/ethnic groups.

Much of the literature on sexual debut categorizes time of sexual debut (e.g., early, late) rather than examining the age of sexual debut. For example, Sandfort et al. [8] compared participants' sexual debut with peers of the same gender and with the same racial/ethnic and educational background to classify their onset of sexual intercourse as early, normative or late, and correlate them with long-term sexual health outcomes. Similarly, French and Dishion [9] utilized a high-risk approach for the development of substance use and problem behavior community sample of adolescents to delineate predictors of sexual debut at an early age, defined as intercourse at age 14 or younger. We extend these studies by examining sexual debut across a range of years (age 12 through 17) rather than categorically. This is a more powerful approach to risk behavior analysis, enabling us to explore a nonlinear relationship of sexual debut and reflecting a more accurate measure of this behavior rather than somewhat arbitrarily creating a categorical threshold variable of "early" vs. "normative" or "later." Moreover, we utilize the Kaplan–Meier method which actually suggests the extent to which being male or female in a certain racial and ethnic group may accelerate the adolescents' sexual debut relative to others who have not had that experience.

2. Methods

2.1. Data source and participants

The YRBS was established by the Centers for Disease Control and Prevention (CDC) to measure health-risk behaviors that result in unintentional and intentional injuries, including risky sexual behaviors and substance use behaviors. For each survey period, the YRBS utilizes a three-stage cluster sampling design to produce a representative sample of high school students (9th through 12th grade) attending public, Catholic and other private schools in the United States [10]. The survey has been conducted biennially since 1991 on a sample

of about 15,000 students. This study utilizes 1999–2007 data (five years: 1999, 2001, 2003, 2005 and 2007) [11].

Data pooled over several years permitted differences among racial and ethnic groups to be distinguished. Data were weighted to adjust for nonresponse and oversampling of African Americans and Hispanics in the sample. The overall weights were scaled to ensure that the weighted count of students was equivalent to the entire sample size, and the weighted proportions of students in each grade corresponded with the national population proportions for each survey year [10].

The questions included in the YRBS have gone through cognitive response testing. The items related to sexual behavior were found to have substantial reliability (.63) [10]. The items of interest in the proposed project were worded identically during years 1999–2007. The Washington University Human Research Protection Office reviewed this project and determined that it does not involve activities that are subject to institutional review board oversight.

2.2. Analysis

The event of interest in this study was time until first sexual intercourse through one's 17th birthday, assessed by the question "How old were you when you had sexual intercourse for the first time?" Responses were "I have never had sexual intercourse," "11 years old or younger," "12 years old," "13 years old," "14 years old," "15 years old," "16 years old" and "17 years old or older." For the purpose of this analysis, those answering "11 years old or younger" were assumed to have the onset of sexual debut by their 12th birthday, "12 years old" by their 13th birthday, "13 years old" by their 14th birthday, "14 years old" by their 15th birthday, "15 years old" by their 16th birthday and "16 years old" by their 17th birthday. Those answering "17 years old or older" were censored and their time variable was 17. Those not yet sexually active were censored and their time variable was their age at the time of the survey. For example, if a respondent was 15 years old and had not yet had sex, their time variable was 15 since they did not have sex by their 15th birthday. If the respondent was 17 years old or above and had not had sex, their time variable was 17. All analyses were performed using SAS-callable SUDAAN version 9.0.1, a software program that uses Taylor series linearization to adjust for design effects of complex sample surveys like the YRBS [12]. Because data were pooled over several years, analyses took into account all stages of clustering (year, stratum and primary sampling unit). Sample weights were also applied to all analyses. Descriptive statistics were used to summarize the data.

The Kaplan–Meier method was used to compute the probability of survival (not having become sexually active) by each age (age 12 through 17). Separate Kaplan–Meier estimates were produced for each level of gender and racial/ethnic group (Caucasians, African Americans, Hispanics and Asians). Modeled results from SUDAAN were used to produce Kaplan–Meier curves using SAS version 9.1.3. A log-rank test is not available for complex survey data to assess equality of survival curves, but Cox models are available for complex survey data. We determined that comparisons using SAS PROC LIFETEST and SAS PROC PHREG, not adjusting for complex sample survey design, produced similar results, with PROC PHREG results somewhat more conservative. This indicated that a Cox regression-based test of effects would be appropriate. Therefore, a Cox regression-based test was employed using SUDAAN PROC SURVIVAL to assess the race and gender effects, accounting for complex sample survey design. SUDAAN results are presented. A Bonferroni threshold of p=.001 was used to correct for multiple comparisons.

3. Results

A total of 72,137 students were included in the pooled dataset (weighted numbers: 15,364 in 1999, 13,601 in 2001, 15,214 in 2003, 13,917 in 2005 and 14,041 in 2007). Participants from the four major ethnic groups found in this country (Caucasians, African Americans, Hispanics and Asians) were included in the analyses; American Indians/Alaskan Natives and Native Hawaiians/Other Pacific Islanders were excluded from the analyses due to small sample size. This left a total of 66,882 students for analysis (weighted numbers: 13,386 in 1999, 12,903 in 2001, 14,375 in 2003, 13,016 in 2005 and 13,202 in 2007) which included similar numbers of adolescent males and females relatively evenly dispersed in Grades 9–12 (Table 1).

Approximately 47.9% of the participants had not yet engaged in their first sexual intercourse (*n*=32,032) at the time of the survey. The distribution of the age of onset of sexual debut is presented in Table 1. The percent of students who had sex did not differ over the years of the study (p=.39). For those who had sex, the mean age at first intercourse differed only slightly over the years (range of 14.2 to 14.4). While the difference was statistically significant (p=.04), this is due to large sample sizes. Since differences in sexual debut over the years of the study were not meaningful, we were able to pool the years together.

Kaplan–Meier curves of the four racial/ethnic groups by gender (Fig. 1) showed that African-American males experienced sexual debut earlier than all other groups (all p<.001) and Asian males and females experienced sexual debut later than all other groups (all p<.001). Differences among all groups were found (all p<.001) except for the following four pairs: Asian males vs. Asian females (p=.065), Caucasian males vs. Caucasian females (p=.126), Caucasian females vs. Hispanic females (p=.010) and Hispanic males vs. African-American females (p=.615).

The likelihood of sexual debut (1−likelihood of surviving free of sexual debut) by the 12th birthday was less than 10% for all groups except African-American males which was at 15% (Table 2). By the 14th birthday, the likelihood of sexual debut was at 20% or less for all groups except Hispanic males (23%) and African-American males (42%). By the 16th birthday, the probability of sexual debut was at 40% or less for all groups except for Hispanics (41% females, 53% males) and African Americans (55% females, 72% males). Note that the likelihood for sexual debut for Asian males and females was considerably lower than for all groups (≤20% by the 16th birthday). By the 17th birthday, the probability for sexual debut was less than 35% for Asians (females 28%, males 33%) and less than 60% for Caucasians (58% females, 53% males) and Hispanic females (59%). The likelihood for sexual debut by this time point was 69% for Hispanic males, 74% for African-American females and 82% for African-American males.

4. Discussion

The findings of this study indicated that there are considerable gender and racial/ethnic group differences in sexual debut. Factors not well understood, but likely to be of importance in early sexual debut, are the social expectations based on gender, ethnicity and sexuality as defined in certain cultures and communities [13]. For example, sex is not readily discussed in the Hispanic and African-American communities possibly decreasing the transmission of knowledge relevant to sexual initiation [14–15]. Asians, especially women, may uphold the value that premarital intercourse is highly inappropriate and can bring shame or dishonor to the family [16]. Moreover, the unique contributions of variables such as African-American male gender role socialization and alternative masculinity norms have received limited attention in relationship to early sexual debut but may also be sources

of influence on this behavior [17]. While these examples are not exhaustive of the influences on sexual debut, they do encourage a multifaceted approach to understanding this behavior. It may also be that racial/ethnic minority group status is a proxy for other variables not measured in the present study such as socioeconomic status or social class. Nonetheless, our findings lend support to past studies which document the differences among racial/ethnic minority groups and age of sexual debut [6,18–20]. Thus, it appears necessary for sexuality education programs to consider issues of cultural acceptance and cultural appropriateness when addressing the topic of healthy sexual behaviors.

It is imperative to consider those adolescents who are having first sexual intercourse at a very early age. Many of those who reported sexual debut by their 12th birthday were African-American males. From the data, we are unable to identify the sexual partners of these adolescents. However, because far fewer female adolescents have had sexual debut at a very early age, we can speculate that these young African-American males were exaggerating reports of sexual debut or are having their first sexual intercourse with older females. Clearly, early age of sexual debut is a complicated matter and though it is important to permit freedom of sexual expression to those adolescents who are mature, intelligent and reasonable enough to give consent for sexual activity, it is equally important to diligently prevent and protect young persons from exploitation and abuse.

The findings of this study were limited by several factors. There are potential moderating and/or mediating effects on sexual debut that the present study did not examine including socioeconomic status or social class, family support, relationships with friends and intimate partners which may have had an impact on participants' initiation of sexual intercourse. The YRBS does not provide information on these explanatory variables that are needed for in-depth analyses. However, the results should be interpreted in the context of ongoing research on risk behaviors of adolescents and young adults, including those studies that provide more detailed measurements of potential determinants of risky sexual behavior. We also rely on participants' self-report for all of the data which contain some unknown level of reporting error. Specifically, exaggerating or denying sexual debut could have impacted the results of this study. While one study found that most adolescents responded to sex-related items honestly, some females underreported their sexual involvement and some males overstated their behaviors [21]. Unfortunately, there is not an ideal method that exists for self-reported honesty and issues of social desirability can impact all behaviors reported in survey research. In addition, the CDC has conducted methodological studies on the use of honesty appeals (asking participants to be truthful when self-reporting behaviors), variations on wording of questions, and data-editing protocols, and found no statistically significant effect on YRBSS prevalence estimates [10].

Despite these methodological limitations, a number of strengths distinguish the present study from previous efforts. Combining data provides greater statistical precision than is available in one dataset and increased the stability of estimates. As a result, differences among racial and ethnic groups were estimated with more power than in past research. Furthermore, we estimated that sexual debut for racial and ethnic groups was often overlooked in past studies due to insufficient sample size. Finally, our results will assist epidemiologists and other health professionals in synthesizing the vast amount of published data on sexual debut.

The implications derived from our study are significant for prevention and intervention efforts. Our findings point to a clear disconnect between the current programs designed to protect our youth from sexual debut at an early age (e.g., abstinence-only sexuality education programs) and their reported behaviors. Specifically, the current study found substantial differences in the risk for sexual debut between African-American and Hispanic

males and females and across all racial/ethnic groups. In addition, our findings identified a group of African-American males who are having sexual intercourse at a very young age. Better understanding of these data is important in improving our ability to protect and educate our youth.

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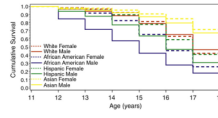
Fig. 1.
Kaplan–Meier curves: probability of surviving free of sexual debut, according to race and gender.

Table 1

Characteristics of the participants, YRBSS (*N*= 66,882)

Variable	Weighted *n*	%
Age		
12 years old or younger	57	0.08
13 years old	60	0.09
14 years old	7251	10.84
15 years old	17,140	25.63
16 years old	17,600	26.32
17 years old	15,683	23.45
18 years old or older	9056	13.54
Missing	36	0.05
Grade		
9th grade	19,411	29.02
10th grade	17,472	26.12
11th grade	15,533	23.22
12th grade	14,248	21.30
Ungraded or other grade	76	0.11
Missing	142	0.21
Sex of subject		
Female	33,063	49.43
Male	33,716	50.41
Missing	103	0.15
Race		
Caucasian	44,386	66.36
African American	10,062	15.04
Hispanic	10,077	15.07
Asian	2357	3.52
Missing	0	0.00
Age of first sexual intercourse		
Never had sexual intercourse	32,032	47.89
11 years old or younger	2170	3.24
12 years old	2062	3.08
13 years old	3802	5.69
14 years old	6167	9.22
15 years old	6779	10.14
16 years old	5146	7.69
17 years old or older	2539	3.80
Missing	6186	9.25

Table 2

Kaplan–Meier (KM) estimates for surviving free of sexual debut through 17th birthday, according to race and gender

Time point (age)	Caucasian		African American		Hispanic*		Asian	
	KM estimate	95% CI	KM estimate	95% CI	KM estimate	95% CI	KM estimate	95% CI
Males								
12.0	0.97	0.96–0.97	0.85	0.83–0.86	0.94	0.93–0.95	0.97	0.95–0.98
13.0	0.94	0.93–0.95	0.72	0.70–0.74	0.88	0.87–0.89	0.95	0.93–0.97
14.0	0.89	0.88–0.89	0.58	0.55–0.60	0.77	0.76–0.79	0.93	0.90–0.94
15.0	0.79	0.78–0.81	0.42	0.40–0.45	0.64	0.62–0.66	0.87	0.84–0.90
16.0	0.65	0.64–0.67	0.28	0.25–0.31	0.47	0.45–0.49	0.80	0.75–0.84
17.0	0.47	0.45–0.49	0.18	0.16–0.20	0.31	0.29–0.33	0.67	0.61–0.73
Females								
12.0	0.98	0.98–0.99	0.97	0.96–0.98	0.98	0.98–0.98	0.98	0.97–0.99
13.0	0.97	0.96–0.97	0.92	0.90–0.93	0.96	0.95–0.96	0.98	0.96–0.99
14.0	0.92	0.92–0.93	0.83	0.81–0.85	0.90	0.89–0.91	0.96	0.94–0.97
15.0	0.82	0.80–0.83	0.66	0.63–0.68	0.78	0.76–0.79	0.91	0.88–0.93
16.0	0.63	0.61–0.65	0.45	0.43–0.48	0.59	0.57–0.61	0.85	0.81–0.88
17.0	0.42	0.40–0.45	0.26	0.23–0.29	0.41	0.39–0.43	0.72	0.64–0.78

*Includes multiracial Hispanic.