

Journal of Sexual Health and Reproductive Medicine**Sexual Behavior in Men and Women Aged 20-59 Years in the United States According to the National Health and Nutrition Examination Survey****Ray M Merrill* and Steven B Ko***Department of Public Health, College of Life Sciences, Brigham Young University, Provo, Utah, 84602, United States***Corresponding author**

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Received: August 06, 2026; **Accepted:** August 17, 2026; **Published:** August 24, 2026**ABSTRACT**

Early initiation of sexual activity and patterns of sexual partnerships are important predictors of sexual health outcomes, yet few population-based studies have examined their links to sexual orientation and demographics. This study examined self-reported age at first sexual intercourse, age at menarche, and number of sexual partners to assess associations with sexual orientation, partner stability, and sexually transmitted infections (STIs). Analyses included 7,843 U.S. adults aged 20-59 years who participated in the National Health and Nutrition Examination Survey (NHANES) (1999-2004). The mean age at first sexual intercourse was 17.38 years, with men reporting significantly younger ages than women. Earlier sexual debut was associated with being previously married, non-Hispanic Black, having lower education, substance use, and lower socioeconomic status, whereas individuals from other racial groups reported older ages at first sex. Individuals who reported having sex with both men and women had the youngest median age at first sexual intercourse. Those who initiated sex earlier had significantly more lifetime partners, with men reporting 1.8 times the number of partners as women. Previously married and never-married individuals, non-Hispanic Black participants, and substance users reported higher numbers of sexual partners. Multiple sexual partners were also associated with sexual orientation, demographic characteristics, and STIs. Among those in same-sex relationships, early sexual debut was linked to a higher number sexual of partners, and no men in this group reporting only one partner. Herpes and genital warts were more prevalent among those with earlier sexual debut and more sexual partners. However, no significant association was observed between age at first sexual intercourse and overall STI prevalence.

Keywords: Sexual Behavior, Age at First Intercourse, Sexually Transmitted Infections, Demographics, Sexual Identity**Introduction**

Positive sexual behaviors, such as consensual safe sex with a trusted partner may support better cardiovascular health by increasing heart rate, lowering stress, and increasing positive emotions related to intimacy. Other benefits of sex include pain relief, boosted immunity, improved self-esteem, decreased depression, and enhanced brain function and memory. However, sexual behaviors such as early age at first sexual intercourse and multiple sexual partners can harm partner relationships and increase the risk of sexually transmitted infections (STIs). One study found that those who had their first sexual experience before age 16 were at higher risk of divorce or separation later in life. There is also evidence that females who experience an early age at menarche before age 12 years are more than twice as likely to engage in sexual activity by age 16 and nearly twice as likely to experience childbirth or pregnancy termination by age 18 compared to those with a later age at menarche [1-14].

Several studies have associated a young age at first sexual intercourse with demographic characteristics. Previous studies have shown that age at first sexual intercourse is associated with race/ethnicity. For example, retrospective data from multiple rounds of the National Survey of Family Growth covering 2006 through 2019 found that Black males had the youngest average age at first vaginal intercourse, followed by Hispanics and then Whites (e.g., 15 years, 15.4 years, and 16 years in 2015-2019), respectively. In another U.S. study, after controlling for background variables Black males reported the youngest median age at first sexual intercourse (15.0 years) and Asian Americans reported the oldest age at first sexual intercourse (18.1 years) [15-18].

A comprehensive review on adolescent sexual behavior found that early sexual debut may be linked to lower academic achievement and other behavior problems in school. This relationship appears to be influenced by the consistency and context of sexual activity, with consistent sexual intercourse, both within and outside of steady relationships, being associated with poorer grades and school-related issues during the ages of 16-18. Socioeconomic

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status (SES) also plays a role, with higher SES associated with delayed sexual debut, possibly due to better parental supervision and resources. In contrast, lower-income families may lack this supervision because of fewer resources, which could lead to an earlier age at first sexual intercourse [19-21].

Studies have found that adolescents who engage in alcohol consumption and smoking at a young age have significantly higher odds of early sexual debut. A study analyzing data from the Seattle Social Development Project (SSDP) and Raising Healthy Children (RHC) found that those who engaged in sexual activity before the age of 15 had higher STI rates in young adulthood compared to those who had sex at an older age (32.5% vs. 16.6% in SSDP; 34.4% vs. 15.8% in RHC, $p < .001$) [11]. One study found that men who had their first sexual experience at an earlier age reported significantly more lifetime partners compared to those who debuted later. Another study found that women who began sexual activity earlier tended to have more lifetime partners. Those engaging in concurrent partnerships had the earliest average sexual debut and the highest number of lifetime partners, while monogamous women reported the latest average debut and the fewest partners [22-26].

Studies have shown that the number of sexual partners a person has is associated with marital status, income, education, substance use, and STIs. In one study, women who had more than one sexual partner before marriage had an increased risk of divorce. Socioeconomic factors such as income and education level have shown mixed relationships with the number of sexual partners, with some studies suggesting that higher education and income are associated with more partners, while others find the opposite. Both alcohol consumption and cigarette smoking, especially when initiated at a young age or used regularly, are associated with having multiple sexual partners. Further, research shows that having more sexual partners is associated with a higher risk of contracting STIs, including chlamydia and gonorrhea. Same-sex sexual relationships may be associated with an even higher number of sexual partners and increased risk of STIs [27-30].

Age at first menstrual period, or menarche, is a significant developmental milestone that can influence sexual behavior. A young age at menarche has been associated with earlier initiation of sexual activity, a higher number of sexual partners, transactional sex, and sexual violence [31,32]. These results may be due to earlier physical maturation leading to increased sexual interest and opportunity. Some studies have also suggested a link between a young age at menarche and an elevated risk of STIs, with this connection potentially mediated by other factors such as age at first intercourse and number of partners. A study based on 1999-2004 National Health and Nutrition Examination Survey (NHANES) data examined trends in age at menarche, providing valuable insights into this developmental milestone [33].

Recent studies have advanced understanding of early sexual behaviors and their health consequences but often focus on adolescents or limited populations with inconsistent inclusion of sexual orientation and partner variables [34-37]. Additionally, less is known about how age at menarche, sexual debut, and lifetime partner counts interact across diverse demographic groups in large national samples. This study addresses these gaps by analyzing adult data from NHANES to understand how

these factors relate to sexual health outcomes.

Because earlier age at first sexual intercourse and multiple sexual partners may harm partner relationships and increase the risk of STIs, understanding factors associated with these conditions and how they interact is important. The purpose of this study is to identify self-reported age at first sexual intercourse, number of sexual partners over the life course, sexual orientation, STIs, and age at menarche among participants in a U.S. national survey of adults. The extent to which these variables are associated with each other, partner stability, and other variables will be explored.

Methods

Data

The National Health and Nutrition Examination Survey (NHANES) is a survey conducted by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS). It collects information about the health and nutrition of Americans; the main objective of the survey is to monitor the health and nutritional status of the U.S. population. It collects demographic data, dietary data, medical examination data, laboratory data, and questionnaire data. The current study focuses on responses to the demographic and questionnaire sections [38,39].

The NHANES Audio Computer Assisted Self Interview (ACASI), conducted in a private setting either in English or Spanish, allows participants to both hear and read questions on the computer. Participants move at their own pace, touching the screen with their response. Proxy respondents or translators were not used when the respondent could not self-report.

This study was based on respondents aged 20-59 years in the United States who completed the sexual behavior questionnaire from the NHANES during 1999-2004 [39]. Among respondents, 7885 indicated they had previously had sexual intercourse and 386 indicated that they had never had sexual intercourse. The weighted percentage of respondents who had sexual intercourse was 96.25%. Among the 7885 respondents who had a history of sexual intercourse, 7843 answered a question about age at first sexual intercourse. Analyses are based on this number of respondents.

Measures

Questions about sexual behavior were asked to men and women aged 20-59 years. Participants were told that they would receive a set of questions about their sexual behavior and that sex meant vaginal, oral, or anal sex. They were told that their answers were strictly confidential. Responses to the following questions were considered in the current study:

"Have you ever had sex?"

"How old were you when you had sex for the first time?"

Females were then asked: "In your lifetime, with how many men have you had sex?" and "In your lifetime, how many women have you had sex?"

Males were asked: "In your lifetime, with how many women have you had sex?" and "In your lifetime, how many men have you had sex?"

"Has a doctor or other health care professional ever told you that you had genital herpes?"

"Has a doctor or other health care professional ever told you that you had genital warts?"

“In the past 12 months, has a doctor or other health care professional told you that you had gonorrhea, sometimes called GC or clap?”
 “In the past 12 months, has a doctor or other health care professional told you that you had chlamydia?”
 Females aged ≥ 12 years were asked their “age when their first menstrual period occurred.”

Demographic variables included in this study were sex, age, marital status, race/ethnicity, poverty income ratio, average alcohol consumption per day, and tobacco or nicotine in the past 5 days. The poverty income ratio is a measurement that divides a family's income by the federal poverty threshold. For example, a ratio of less than 1 indicates poverty, whereas a ratio of 5 means a household income of five times the poverty threshold. Classifications of these variables are presented in Table 1.

Table 1: Mean Age at First Sexual Intercourse and Significance of Each Variable

Parameter	No.	%*	Estimate (SE)*†	t Value	Pr > t
Intercept			16.97 (0.28)	60.56	<.0001
Sex					
Women	4164	50.27	0.00	.	.
Men	3679	49.73	-0.33 (0.10)	-3.34	0.0017
Age Group					
20-29	2166	22.74	0.00	.	.
30-39	2056	26.60	0.37 (0.15)	2.57	0.0138
40-49	2051	28.83	0.75 (0.18)	4.15	0.0001
50-59	1570	21.83	1.11 (0.20)	5.46	<.0001
Marital Status					
Married (cohabitating)	4889	64.32	0.00	.	.
Previously married	1085	13.65	-0.28 (0.12)	-2.41	0.0202
Never married	1585	18.14	0.42 (0.16)	2.66	0.0109
Unknown	284	3.90	0.11 (0.33)	0.32	0.7496
Race/Ethnicity					
Non-Hispanic White	3877	71.65	0.00	.	.
Non-Hispanic Black	1652	11.44	-1.37 (0.13)	-10.50	<.0001
Mexican American	1712	7.78	0.77 (0.17)	4.38	<.0001
Other Race, Incl Multi-Racial	602	9.12	0.77 (0.28)	2.76	0.0083
Education					
< High school	1937	16.34	0.00	.	.
High school diploma (including GED)	1883	25.23	0.40 (0.11)	3.59	<.0001
More than high school	4018	58.35	1.21 (0.11)	10.64	<.0001
Unknown	5	0.08	0.96 (0.89)	1.08	0.2871
Poverty Income Ratio					
<1	4064	43.58	0.00	.	.
1-<3	1480	19.52	-0.03 (0.17)	-0.21	0.8385
3-<5	760	12.15	0.07 (0.17)	0.42	0.6748
≥ 5	1539	24.75	0.44 (0.19)	2.28	0.0272
Average # alcoholic drinks/day – past 12 months					
0	2137	23.73	0.00	.	.
1-2	3280	45.4	-0.38 (0.26)	-1.46	0.1525
3-4	1347	17.76	-1.08 (0.25)	-4.44	<.0001
≥ 5	1079	13.11	-1.14 (0.25)	-4.55	<.0001
Used tobacco/nicotine in the past 5 days					
No	5286	65.15	0.00	.	.
Yes	2557	34.85	-1.29 (0.09)	-14.63	<.0001

Data source: NHANES, 1999-2004.

*Weighted estimates, based on the complex sampling design used.

†Estimates were based on a single regression model adjusting for all the variables in the table, with statistically significant values italicized.

Statistical Analysis

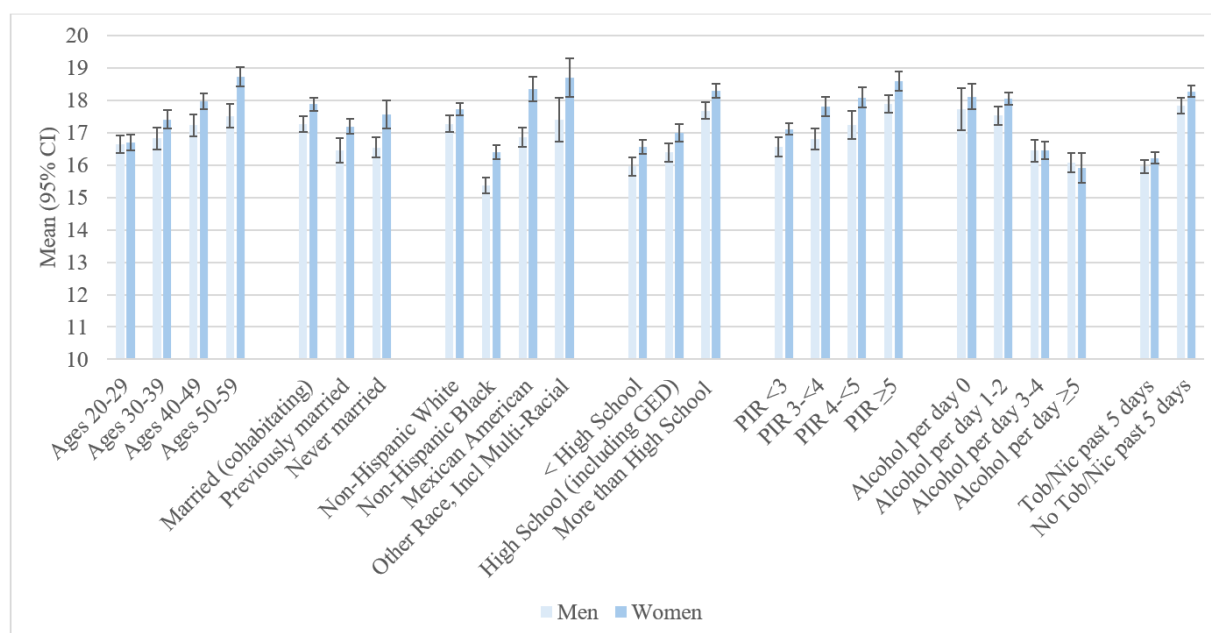
Estimates were determined by taking the survey stratum, primary sampling units, and sampling weights into consideration for the years 1999 through 2004. Descriptive statistics included counts, frequencies, percentages, means, medians, and regression coefficients. The number of lifetime sexual partners was sufficiently positively skewed that median scores were used to summarize that variable. Because of the skewness, the median estimate was used to describe what was typical value. Estimates accounted for survey stratification and sampling weights. Estimated associations between sex, age, marital status, race/ethnicity, education, alcohol drinking, and tobacco/nicotine use with mean age at first sexual intercourse were computed using multiple regression. Differences in mean age at first sexual intercourse between those with versus without certain sexually transmitted infections was adjusted by sex, age, marital status, race/ethnicity, education, alcohol drinking, and tobacco/nicotine use. Statistical independence between categorical variables was assessed for significance using the Rao-Scott Chi-Square Test. Statistical significance of regression coefficients was based on the t-test. Variability in the data was described using

the standard error (SE) and the 95% confidence interval (CI). All statistical tests were two-sided, with a significance level of 0.05. All analyses were conducted using Statistical Analysis System (SAS) software, version 9.4 (SAS Institute Inc., Cary, NC, USA, 2016).

Results

Age at First Sexual Intercourse

The average age at first sexual intercourse was 17.38 (SE = 0.08). The average age at first sexual intercourse is significantly lower among those currently aged 20-29 years and increases successively in older age groups. The average age at first sexual intercourse was significantly younger for men than women (17.04 [SE = 0.10] vs. 17.71 [SE = 0.07]), among those who were previously married (vs. married), non-Hispanic Black participants (vs. non-Hispanic Whites), and individuals with lower education and a poverty income ratio <1 (Table 1). Mexican Americans and individuals in Other Racial Groups (vs. non-Hispanic Whites) have the oldest age at first sexual intercourse. Alcohol and tobacco use are both positively associated with a younger age at first sexual intercourse.



Data source: NHANES, 1999-2004.

*Weighted estimates, based on the complex sampling design used.

Figure 1: Mean Age at First Sexual Intercourse by Selected Variables

The average age at first sexual intercourse is shown for selected variables in Figure 1. Men consistently reported a younger age at first sexual intercourse than women across the levels of these variables. Significant interaction terms involved sex and age ($p < .0001$) and sex and race/ethnicity ($p = 0.0002$); that is, the lower average age at first sexual intercourse among males was less pronounced among the younger current age groups and among non-Hispanic Whites.

The prevalence of selected STIs is shown in Table 2, with genital warts being the most common followed by genital herpes. The overall prevalence of one or more of these STIs was 9.3%. The average age at first sexual intercourse was significantly lower among those with genital herpes or genital warts, after adjusting for age, sex, marital status, race/ethnicity, education, and poverty income ratio.

Table 2: Prevalence of Sexually Transmitted Infections and Estimated Difference in Mean Age at First Sexual Intercourse Between Those with Versus Without a Sexually Transmitted Infection

Disease	No.	%*	Estimate (SE)*†	t Value	Pr > t
Ever told by a doctor that you have ...					
Genital herpes	276	3.86	-0.55 (0.23)	-2.43	0.0192

Genital warts	381	5.76	-1.22 (0.16)	-7.48	<.0001
Gonorrhea	35	0.26	-0.99 (1.00)	-0.99	0.3278
Chlamydia	72	0.52	-0.44 (0.31)	-1.44	0.1583

Data source: NHANES, 1999-2004.

*Weighted estimates, based on the complex sampling design used.

†The regression estimate associated with each disease was adjusted for sex, age, marital status, race/ethnicity, education, and poverty income ratio, alcohol drinking, and tobacco/nicotine use. Italicized values are statistically significant.

Sexual Orientation

Sexual orientation is described in Table 3. A higher percentage of men reported having sexual relationships only with men than women reported having sexual relationships only with women. However, women had a higher percentage of sexual relationships with both men and women.

Table 3: Sexual Orientation and Number of Sexual Partners Over the Life Course

		No.	%*	Number of sexual partners in lifetime Median* (95% CI)	One partner only in lifetime %*	One partner only in lifetime if age of first sexual intercourse <20%*	One partner only in lifetime if age of first sexual intercourse ≥20%*
Women with	Men	3912	94.61	3.65 (3.42-3.88)	21.90	13.97	47.19
Women with	Women	8	0.16	1.56 (# too small)	25.57	0.00	45.64
Women with	Both	202	5.23	8.62 (7.21-10.02)			
				1.03 (0.83-1.22)			
Missing		42					
Men with	Women	3447	95.38	6.94 (6.31-7.57)	11.59	6.27	37.17
Men with	Men	25	0.75	10.73 (3.36-18.10)	0.00	0.00	0.00
Men with	Both	143	3.87	7.22 (4.59-9.86)			
				3.16 (1.28-5.05)			
Missing		64					

Data source: NHANES, 1999-2004. CI: Confidence Interval.

*Weighted estimates, based on the complex sampling design used. Italicized values are statistically significant.

Number of Sexual Partners

The median number of sexual partners among women and men is shown in Figure 2. Men had 1.8 times as many sexual partners as women. The number of men who reported having sexual relationships with men was 3.6 times greater than the number of women who reported having sexual relationships with women.

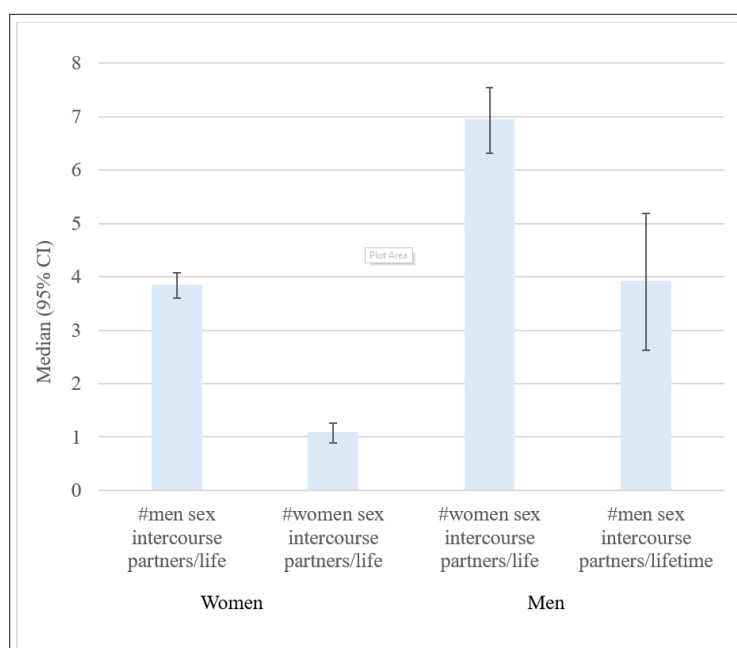


Figure 2: Median Number of Sexual Partners by Sexual Orientation

The median number of sexual partners is further detailed by sexual orientation in Table 3. Women had fewer lifetime sexual partners with men than men had with women; similarly, women had fewer lifetime sexual partners with women than men had with men. Men and women whose first sexual intercourse occurred at age ≥ 20 years (versus < 20) were more likely to have one partner in their lifetime. Among those in same sex relationships, none had only one partner if their age of first sexual intercourse was < 20 years, whereas 46.64% of women and 0.00% of men had one partner if their age at first sexual intercourse was ≥ 20 years.

The median number of sexual partners among women and men is shown for selected variables in Table 4. Among women who had sexual intercourse with men, the number of partners is significantly greater for those who reported a younger age at first sexual intercourse, were previously or never married, were non-Hispanic Black, had a poverty income ratio < 1 , reported higher alcohol consumption, and used tobacco/nicotine. Among men who had sexual intercourse with women, the number of partners was significantly greater for those who reported a younger age at first sexual intercourse, were previously married, were non-Hispanic Black, reported higher alcohol consumption, and used tobacco/nicotine. Small numbers limited the assessment of the median number of sexual partners for women having sexual intercourse with women and men having sexual intercourse with men. However, men who had sexual intercourse with men are significantly more likely to have never been married.

Table 4: Median Number of Sexual Partners Among Men and Women by Selected Variables

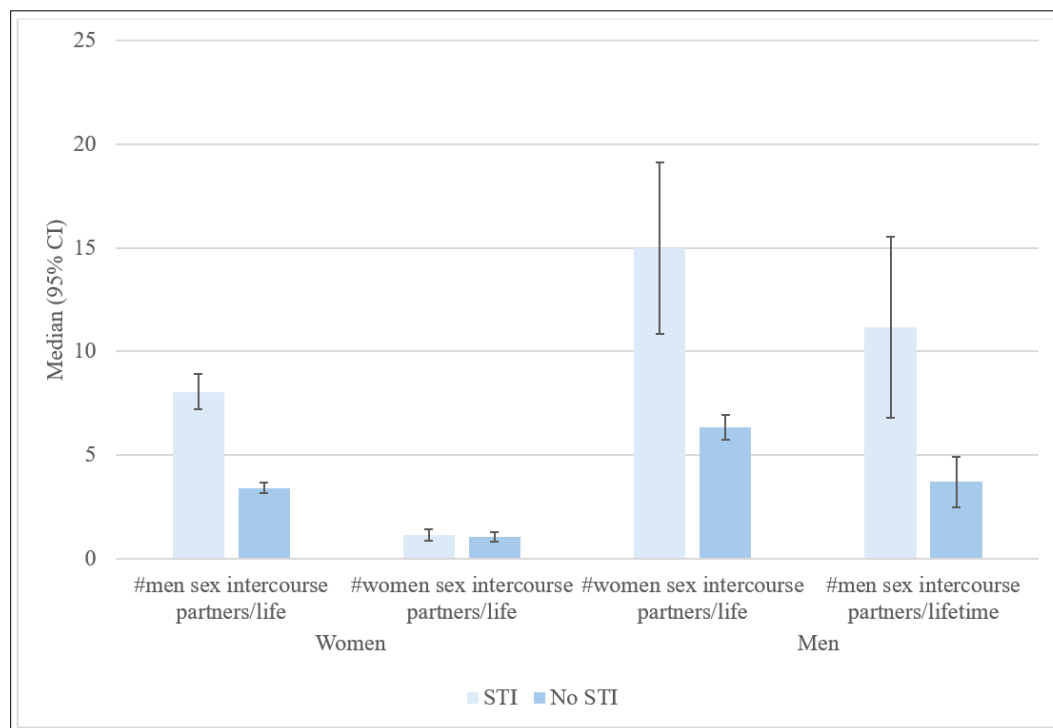
	Women		Men	
	Men Sexual Intercourse Partners/ Life 99.81%	Women Sexual Intercourse Partners/ Life 5.09%	Women Sexual Intercourse Partners/ Life 99.26%	Men Sexual Intercourse Partners/ Life 4.61%
	Median* (95% CI)	Median* (95% CI)	Median* (95% CI)	Median* (95% CI)
Age at First Sexual Intercourse				
9-15	6.74 (6.11-7.36)	1.09 (0.90-9.20)	14.20 (12.55-15.84)	5.62 (2.04-9.20)
16-17	4.52 (4.19-4.85)	1.49 (1.22-3.07)	7.27 (6.52-8.01)	1.81 (0.55-3.07)
18-19	3.16 (2.78-3.53)	1.00 (-1.01-5.31)	4.76 (4.30-5.22)	1.42 (-2.47-5.31)
≥ 20	1.21 (1.05-1.36)	1.00 (-0.14-17.43)	1.77 (1.59-1.96)	6.52 (-4.39-17.43)
Marital Status				
Married (cohab)	3.03 (2.74-3.31)	1.00 (0.71-2.57)	5.90 (5.47-6.33)	1.35 (0.13-2.57)
Previously married	5.38 (4.91-5.86)	1.66 (1.30-1.85)	13.39 (10.80-15.97)	1.52 (1.18-1.85)
Never married	4.99 (4.49-5.50)	1.59 (1.21-15.02)	7.31 (5.97-8.65)	9.12 (3.22-15.02)
Race/Ethnicity				
Non-Hispanic White	3.91 (3.62-4.21)	1.06 (0.76-7.95)	6.53 (5.81-7.26)	4.31 (0.67-7.95)
Non-Hispanic Black	5.05 (4.70-5.39)	1.37 (1.11-2.13)	12.71 (10.91-14.50)	1.70 (1.27-2.13)
Mexican American	1.68 (1.59-1.78)	1.00 (-6.98-3.76)	4.77 (4.35-5.19)	2.27 (0.79-3.76)
Other Race	2.71 (2.16-3.25)	1.04 (0.71-0.37)	5.61 (4.57-6.66)	4.88 (# too small)
Education				
< High school	3.62 (3.11-4.12)	1.01 (0.76-4.85)	7.70 (6.60-8.79)	3.07 (1.28-4.85)
HS/GED	3.92 (3.49-4.36)	1.45 (1.11-6.91)	7.11 (6.26-7.96)	4.49 (2.06-6.91)
More than HS	3.85 (3.50-4.21)	1.00 (0.69-6.20)	6.55 (5.79-7.31)	3.88 (1.57-6.20)
Poverty Income Ratio				
< 1	4.35 (3.89-4.80)	1.10 (0.64-1.36)	6.18 (4.92-7.43)	1.83 (1.51-2.14)
1- < 3	3.93 (3.48-4.39)	1.35 (0.96-1.75)	7.50 (6.45-8.54)	9.78 (3.76-15.81)
3- < 5	3.33 (2.72-3.94)	1.08 (0.77-1.38)	6.79 (5.95-7.62)	2.66 (0.81-4.51)
≥ 5	3.56 (3.05-4.07)	1.00 (0.53-12.17)	6.24 (5.22-7.26)	4.92 (-2.33-12.17)
Average # alcoholic drinks/day – past 12 months				
0	2.24 (1.83-2.65)	1.05 (0.78-2.45)	4.57 (3.57-5.57)	1.78 (1.12-2.45)
1-2	3.98 (3.65-4.30)	1.00 (0.51-6.06)	5.96 (5.52-6.41)	3.88 (1.70-6.06)
3-4	5.91 (5.22-6.60)	1.15 (0.96-1.34)	8.52 (7.53-9.51)	9.46 (2.00-16.93)
≥ 5	5.35 (3.96-6.73)	3.41 (1.50-5.70)	9.16 (8.21-10.12)	3.00 (0.30-5.70)
Used tobacco/nicotine in the past 5 days				
No	2.99 (2.80-3.17)	1.00 (0.61-4.46)	5.13 (4.69-5.57)	3.20 (1.93-4.46)

Yes	5.55 (5.12-5.98)	1.22 (1.02-14.21)	9.20 (8.57-9.82)	7.16 (0.11-14.21)
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Data source: NHANES, 1999-2004. CI: Confidence Interval.

*Weighted estimates, based on the complex sampling design used. Statistically significant values are italicized.

The median number of sexual partners for women and men is significantly higher among those with a history of an STI, except among women who had sex with women, for whom there is no difference (Figure 3).



Data source: NHANES, 1999-2004.

*Weighted estimates, based on the complex sampling design used.

Figure 3: Median Number of Sexual Partners for Women and Men by Sexually Transmitted Infection Status

Age at First Menstrual Period

Average age at first menstrual period is 12.60 (SE = 0.05), ranging from 8 to 21. Age at first menstrual period is positively associated with age at first sexual intercourse (Table 5). In addition, heterosexual behavior was significantly more common with increasing age at first sexual intercourse (Table 5). Age at first menstrual period was not significantly associated with the median number of male sexual partners or the median number of female sexual partners over the lifetime. Nor was age at first menstrual period significantly associated with the risk of STIs. Of the demographic, alcohol, and tobacco variables considered, age at first menstrual period was only significantly associated with current age, increasing from 37.09 (SE = 1.21) years when menstruation started at ages 8-9 to 41.18 (SE = 0.74) years when menstruation started at ages ≥ 16 ($p = 0.0075$).

Table 5: Mean Age at First Menstrual Period and Percent Heterosexual by Age at First Sexual Intercourse

Age at First Sexual Intercourse	No.	Column %*	Mean Age at First Menstrual Period			Heterosexual		
			Estimate (SE) *	t Value	Pr > t	Row %* (SE)*	Rao-Scott Chi-Square Test	Pr > ChiSq
8-9	149	3.15	16.74 (0.39)	0.00		96.06 (2.61)	18.18	0.0199
10-11	805	19.13	17.42 (0.12)	1.70	0.0963	96.30 (0.93)		
12-13	2121	54.01	17.68 (0.10)	2.17	0.0354	96.39 (0.58)		
14-15	765	17.95	18.05 (0.16)	3.38	0.0015	97.29 (0.81)		
≥ 16	233	5.76	18.30 (0.21)	3.61	0.0008	99.41 (0.40)		

Data source: NHANES, 1999-2004.

*Weighted estimates, based on the complex sampling design used. Statistically significant values are italicized.

Discussion

The purpose of this study was to identify self-reported age at first sexual intercourse, number of sexual partners over the life

course, sexual orientation, STIs, and age at menarche among participants in a U.S. national survey of adults. The extent to which these variables were associated with each other, partner stability, and other variables was evaluated.

Age at First Sexual Intercourse

Age at first sexual intercourse was significantly lower among males, previously married individuals, non-Hispanic Black participants, individuals with lower educational attainment and lower income, and those who consumed more alcohol and used more tobacco/nicotine.

Sex

Cultural expectations and gender norms appear to have an important role in age at first sexual intercourse. Societal norms that emphasize masculinity often promote the expectation that men should engage in sexual activity earlier, creating pressure for younger initiation [40]. Racial and ethnic factors also contribute to differences in sexual debut, with Black males more likely to initiate sexual activity earlier than their White or Hispanic counterparts. These patterns may reflect cultural influences specific to racial and ethnic backgrounds, as well as the impact of lower education and income levels among non-Hispanic Black participants [17,41]. Moreover, prevalence data suggest that men are more likely than women to report mutual willingness during their first sexual experience. This could contribute to a more positive perception of early sexual activity among males, which may influence earlier initiation [42].

Age

Mean age at first sexual intercourse was youngest among those currently aged 20-29 and successively increased among those in the older age groups, suggesting that the difference in age at first sexual intercourse between the sexes became more similar in more recent years. This trend may be attributed to shifting social norms, increased gender equality, and greater access to comprehensive sexual education, which have influenced attitudes toward relationships and sexual behavior over time [43,44]. For instance, in Britain the percentage of adults who considered premarital sex as “not wrong at all” rose from 42% in 1983 to 74% in 2018. In the U.S, the percentage rose from 29% in the early 1970s to 58% between 2010 and 2012 [45,46].

In those currently aged 20-29, there was no significant difference in age at first sexual intercourse between males and females, but the age at first sexual intercourse was increasingly older among females in the older age groups, which may be associated in part with a decreasing age at menarche among females [47].

Previously Married vs. Married

The study found that individuals who were previously married reported a younger age at first sexual intercourse compared to those who were currently married. One potential explanation for this finding is the association between cohabitation and earlier sexual debut. Cohabiting individuals are more likely to report initiating sexual activity before age 18, and cohabitation is also linked to a higher risk of divorce later. This relationship suggests that earlier sexual debut may contribute to marital instability and eventual divorce [48]. Additionally, longer periods of sexual activity before marriage, a trend seen among younger generations, have been statistically associated with remarriage [49].

Non-Hispanic Blacks

Non-Hispanic Black male and female participants reported a younger age at first sexual intercourse compared to other racial/ethnic groups. Several factors likely contribute to this finding. Early physical maturation among African American adolescents compared to their ethnic counterparts may partly explain their earlier sexual debut, as biological factors can influence the timing of sexual behavior [50,51]. Additionally, discussions about sex are less prevalent in African American and Hispanic communities, which could reduce access to sexual education that may delay sexual initiation [52]. Masculinity norms specific to African American males, including unique socialization patterns, may also play a role in shaping behaviors associated with earlier sexual debut [53]. These differences may also be influenced by cultural factors, socioeconomic conditions, and variations in family structures or community norms, which shape attitudes toward sex, relationships, and early life experiences [16].

Education

Educational factors are also influential. Males who experience academic challenges, such as being held back in school, are more likely to report earlier sexual initiation. This relationship could be explained by adolescents who have sex earlier potentially losing interest in their schoolwork, while those with higher educational goals may be more likely to delay sexual initiation because they recognize the risks of early sexual activity [54,55].

Poverty

Neighborhood factors further contribute to these disparities. Concentrated poverty, unemployment, and female-headed households in Black neighborhoods have been linked to earlier sexual initiation. Additionally, family background appears to play a role, as individuals with mothers who gave birth as teenagers or worked during their childhood are more likely to engage in early sexual activity [54]. Moreover, segregation is posited as a fundamental cause of racial disparities in sexual risk behaviors because it may structure the environments where adolescents grow up by concentrating poverty, limiting access to resources, and shaping social norms and networks that can affect sexual health outcomes [16].

Alcohol and Tobacco

Alcohol consumption and tobacco use have been linked to an earlier age of first sexual intercourse [24,56]. Alcohol consumption can impair cognitive function, which may encourage adolescents to engage in riskier behaviors, including early sexual initiation. Additionally, early alcohol use is often associated with other risky behaviors, such as tobacco use, illicit drugs use, and risky sexual behavior. This suggests that alcohol consumption might be part of a broader trend of risky behavior that includes sexual activity [57,58].

Age at first sexual intercourse was also associated with age at menarche and STIs, as will be discussed below.

Number of Sexual Partners

Younger age at first sexual intercourse was significantly associated with a higher number of sexual partners over the life course. Multiple sexual partners, in turn, were associated with certain demographic factors and behaviors, sexual orientation, and STIs.

Sexual Orientation

Although our data do not allow us to establish a direct causal relationship between early sexual initiation and sexual orientation, the results suggest that early sexual experiences are correlated with greater sexual orientation diversity, and further research is needed to explore the relationships between early sexual debut and sexual orientation. The findings are consistent with other research showing that sexual orientation influences the number of sexual partners [59].

Sex

Men reported a higher median number of female sexual partners than the number of male partners reported by women. This difference in the number of reported sexual partners is consistent with previous literature, which often attributes this difference to social desirability bias and gender norms [60].

Individuals who reported sexual experiences with both males and females had the highest number of partners overall. This finding is consistent with research suggesting that bisexual individuals may have more diverse sexual experiences and potentially more partners over their lifetime [61].

The higher number of lifetime partners among those who initiated sexual activity at a younger age is consistent with the literature and may be related to a longer period of sexual activity and potentially riskier sexual behaviors associated with early debut [12,28,62].

Marital status, race/ethnicity, education, income, alcohol consumption, and tobacco use were all associated with the number of sexual partners:

Marital Status

Previously married and never married individuals reported a higher number of sexual partners over their lifetime compared with those currently married. Previously married and never-married individuals may have had more opportunities and time to have a greater variety of relationships. Having fewer sexual partners before marriage is associated with greater marital satisfaction and stability, a phenomenon that is less often observed among those who were previously married, whose relationship histories typically reflect more partners [63-68].

Race/Ethnicity

Non-Hispanic Black respondents reported a higher number of partners compared with other racial/ethnic groups. This finding is consistent with previous research, though it is important to interpret this finding in the broader context of socioeconomic factors [69].

Education and Income

No significant association was found between education, income, and number of lifetime sexual partners. These results contrast with the limited previous research that has identified wealth as an influence on lifetime sexual partners. One study found that individuals in the lowest and highest wealth quintiles reported a greater number of sexual partners compared to those in the middle quintiles in both men and women. However, we were unable to find any studies assessing the association between education and number of sexual partners [66].

Alcohol and Tobacco Use

Higher alcohol consumption and tobacco use were associated with higher numbers of sexual partners. This aligns with research linking substance use with increased sexual risk-taking behaviors [29]. The disinhibiting effects of alcohol may lead to impaired judgement and increased impulsivity making adolescents ages 12-17 more likely to engage in risky sexual behaviors [29,56]. During adolescence and young adulthood, the brain areas responsible for decision making and emotional regulation are not fully developed and substance use can further impair these processes resulting in risky sexual behavior [29,67]. Additionally, psychological problems such as depression caused by substance use may negatively affect sexual decision-making, contributing to increased sexual risk-taking and a higher number of sexual partners [56,70].

Age of First Menstrual Period

The study found a positive association between age at first menstrual period and age at first sexual intercourse, as seen in previous studies [26,25]. This suggests that later menarche is associated with later sexual debut. However, age at first menstrual period was not significantly associated with the number of sexual partners, demographic characteristics other than age, or STIs. The current study also found that those whose age at menarche was ≥ 16 years were older age, which may be attributed to increasingly sedentary lifestyles with a greater consumption of high-calorie foods, both of which have been linked to earlier menarche [71,72].

Sexually Transmitted Diseases

The results showed that an earlier age at first sexual intercourse was associated with a significantly higher prevalence of genital herpes and genital warts. This aligns with previous research suggesting links between earlier sexual debut and increased STI risk [28,62,73]. This result is possibly explained by longer periods of sexual activity, a greater number of partners, or other behavioral and social factors that accumulate over time [11].

The lack of a significant association between age at first sexual intercourse and gonorrhea or chlamydia may be influenced by smaller numbers, but also because chronic viral infections like herpes and warts persist and are more likely to be reported, while bacterial infections such as gonorrhea and chlamydia are often cured and may go unreported. The median number of sexual partners was significantly higher for those with a history of an STI, except among women who had sex with women, for whom there was no difference (Figure 3). The higher median number of sexual partners among those with STIs is consistent with previous studies [30]. The lack of difference among women who had sex with women may be because these women tend to just have one partner. Other studies suggest a similar trend, indicating that women who have sex with women may experience a lower burden of STIs compared to women who have sex with men or women who have sex with both men and women, potentially due to distinct risk profiles or transmission patterns [74,76].

Conclusion

This study highlights the various demographic and behavioral influences on the timing of first sexual intercourse, number of lifetime sexual partners, and age at menarche. It also shows how these variables are associated with sexual orientation,

partner stability, STIs, and how sexual orientation influences the number of sexual partners and STIs. The association between sexual orientation and the number of sexual partners depends on several demographic and behavioral factors. A movement toward earlier age at first sexual intercourse was seen in both males and females. Those most likely to have a younger age at first sexual intercourse were Non-Hispanic Black participants and individuals with lower education, lower income, and those who consumed 3 or more alcoholic beverages per day or used tobacco/nicotine. A younger age at first sexual intercourse was associated with earlier age at menarche, more sexual partners, and a higher prevalence of STIs (particularly genital herpes and genital warts). Women who have sex with both women and men and men who have sex with men have the highest number of sexual partners. No women who had sex with women had one sexual partner over their lifetime if their age at first sexual intercourse was <20 years, but several had just one partner if their age at first sexual intercourse was ≥20 years of age. No men who had sex with men had just one sexual partner over their lifetime, regardless of age at first sexual intercourse. These results identify individuals at greater risk for partner instability and STIs and may be useful in developing public health intervention programs.

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