Many Young Teenagers Consider Oral Sex More Acceptable and Less Risky Than Vaginal Intercourse

Ninth graders surveyed in two California public schools had more experience with oral than with vaginal intercourse, and their intended behavior in the next six months favored oral sex.[1] The teenagers estimated that they have less chance of becoming pregnant or contracting chlamydia or HIV if they engage in oral sex than if they have vaginal intercourse, as well as less chance of jeopardizing their relationship or their reputation, getting into trouble or feeling guilty about their behavior. Respondents expressed greater acceptance of oral sex than of vaginal intercourse for youth their age, and said that oral sex is the more prevalent behavior among their peers.

The survey was conducted in 2003 as part of a longitudinal study of the relationship between risk and benefit perceptions and sexual activity. In all, 580 ninth graders, with an average age of 14.5 years, completed the self-administered questionnaire; 58% were female and 42% male. Forty percent of respondents were white, 24% Hispanic, 17% Asian and the rest members of other ethnic groups. Roughly equal proportions said that their mothers were college graduates, had some college education and had a high school education or less.

Some 20% of the teenagers said that they had had oral sex, a significantly higher proportion than reported experience with vaginal intercourse (14%). Likewise, a significantly greater proportion intended to have oral sex in the next six months than intended to have vaginal sex (32% vs. 26%). Males and females did not differ in their reports of sexual experiences and intentions.

Participants were asked to estimate their chances of experiencing a variety of health, social and emotional outcomes of oral and vaginal sex, and researchers conducted analyses of variance to compare the responses for the two types of behavior. A substantial minority of the teenagers (13–14%) were unaware that chlamydia and HIV infection can be transmitted through oral sex; the rest perceived the chances of acquiring these infections through oral sex (38% for each) as being lower than the chance associated with vaginal sex (50–53%). Respondents also considered pregnancy less likely after oral than after vaginal sex (17% vs. 68%). In addition, teenagers thought they had lower chances of having a relationship deteriorate, developing a bad reputation, getting into trouble, feeling bad about themselves and feeling guilty if they had oral sex (36%–63%) than if they had vaginal intercourse (42–71%). They saw both behaviors as equally likely to make them feel good about themselves (40%), increase their popularity (27%) and improve their relationship (40–41%), but they considered vaginal sex more likely to be a pleasurable experience than oral sex (72% vs. 59%). Although some results varied by respondents' sexual experiences or intentions, the teenagers consistently viewed oral sex as less likely than vaginal sex to lead to negative outcomes.

Consistent with the differences in experience, intentions and perceived risks, respondents' attitudes toward the two sexual behaviors also varied. Teenagers agreed more strongly that people their age are too young to have vaginal sex than that they are too young to have oral sex; they also indicated that vaginal intercourse, more than oral sex, is counter to their beliefs. However, for both dating relationships and other types of partnerships, respondents noted greater acceptance of oral than of vaginal sex.

Finally, when asked to estimate the prevalence of behaviors and intentions among youth their age, respondents said they believed that 47% of their peers of had had oral sex, but that only 41% had had vaginal sex. Similarly, they anticipated that in the next six months, a larger proportion will have oral sex than will have vaginal sex (39% vs. 34%), and a smaller proportion will choose not to have oral sex than not to have vaginal intercourse (42% vs. 45%). They thought that 27% will wait until they are married to have oral sex, compared with 31% for vaginal sex.

The researchers acknowledge a number of limitations to their study, notably that the survey defined vaginal but not oral sex for participants, and that the data do not permit an assessment of causal relationships between perceptions and behavior. Nevertheless, they contend that the findings have critical public health implications. They conclude that "to help adolescents make informed sexual decisions, parents, health care providers, and other educators must broaden their clinical and educational efforts"; in particular, these efforts should cover the possible health, emotional and social consequences of all sexual behaviors, coital and noncoital, as well as methods for preventing unhealthy outcomes.–*D. Hollander*

REFERENCE

1. Halpern-Felsher BL et al., Oral versus vaginal sex among adolescents: perceptions, attitudes, and behavior, *Pediatrics,* 2005, 115(4):845–851.

Some Studies May Underestimate Condom's Role in STD Prevention

Studies that measure the role of male condoms in preventing STD transmission by comparing users with nonusers may underestimate the method's effectiveness because of differences between users and nonusers that are difficult to measure.[1] In a case-crossover analysis using data from women visiting an Alabama STD clinic, in which each participant served as her own control, consistent use of the method was associated with a significant reduction in the incidence of gonorrhea and chlamydia, particularly when condoms neither broke nor slipped off. A cohort analysis based on the same data set, however, in which patterns of condom use and infection status were compared across individuals, showed no reduction in risk associated with consistency of use.

Participants were 18–34-year-old women attending the clinic between 1992 and 1995, who were neither pregnant nor planning to conceive within the next six months. At their initial study visit, the women underwent STD testing, received an intervention that promoted consistent and correct use of condoms and spermicides, completed a behavioral interview, and learned how to use a diary to record their sexual activity and use of barrier methods. Par-

ticipants were scheduled for six monthly follow-up visits, at which they discussed their diary entries with project staff, completed additional interviews, were again tested for STDs and received a six-week supply of their chosen barrier method.

Both analyses examined the incidence and predictors of gonorrhea and chlamydia in the one-month intervals between follow-up visits. The case-crossover analysis compared intervals in which no infection was diagnosed with intervals in which either infection was detected in the same woman (and included only women who had both kinds of intervals), thus making each woman her own control and eliminating potential bias from unmeasured factors that do not change over time. The cohort analysis also compared intervals with and without a diagnosis, but included all women, regardless of whether they became infected during follow-up.

Most of the 1,122 women who enrolled in the study were black (89%), were younger than 25 (53%), had no more than a high school education (70%) and were neither married nor living with a partner (89%). All but 9% had had sex in the month before entering the study; most (68%) had had only one partner during that time. Thirty-one percent of participants tested positive for gonorrhea or chlamydia at study entry.

The analyses are based on data from 919 participants who made at least one follow-up visit and reported on both their sexual activity and their frequency of condom use (categorized as consistent, or 100% use, with neither breakage nor slippage; consistent with breakage or slippage; inconsistent; or no use). For the case-crossover analysis, the researchers used data on 228 intervals in which gonorrhea, chlamydia or both were diagnosed and 743 matched intervals from the same women in which no infection was diagnosed. The cohort analysis included 245 intervals with a diagnosis (all of those from the case-crossover analysis plus 17 that were ineligible for that analysis) and 3,896 intervals in which no infection was detected.

In the case-crossover analysis, the risk odds ratio derived from conditional logistic regression indicated that the likelihood of infection with gonorrhea or chlamydia was significantly lower during intervals in which a woman consistently used condoms than during intervals in which she never used them (odds ratio, 0.5). Additionally, the association was stronger for intervals characterized by consistent use with no breakage or slippage than for consistent use with either of these problems. This analysis also revealed that a diagnosis was significantly more likely in an interval when a woman had had multiple partners than in an interval when she had had only one (1.8), and that the likelihood of infection during a given interval increased significantly with the number of unprotected sex acts (i.e., occasions of nonuse of condoms or use with slippage or breakage).

By contrast, using unconditional logistic regression, the cohort analysis showed no difference in the incidence of infection by consistency of condom use and no trend toward greater risk of infection with an increase in unprotected sex. Having multiple partners was once again associated with an increased risk of infection (risk odds ratio, 2.1), as were being younger than 25 (1.5) and receiving a diagnosis of chlamydia or gonorrhea at enrollment in the study (1.5).

Given the strengths of their study—notably, the use of two analytic approaches, including one designed to "circumvent unmeasured confounding and reduce its impact"—the researchers contend that "epidemiologic studies of condom effectiveness are probably confounded by unmeasured differences between users and nonusers." Moreover, they conclude that "the likely result of such confounding is underestimation of the effectiveness of condoms."—*D. Hollander*

REFERENCE

1. Warner L et al., Application of the case-crossover design to reduce unmeasured confounding in studies of condom effectiveness, *American Journal of Epidemiology,* 2005, 161(8):765–773.

Social Factors May Explain Why Youth Who Move Are At Risk of Sexual Initiation

Teenagers who have recently moved are more likely than others to begin having premarital sex, but moving itself—which has adverse consequences on a range of adolescent behaviors—does not explain the adoption of this behavior.[1] In a sample of youth participating in the first two waves of the National Longitudinal Study of Adolescent Health (Add Health), the proportion initiating sexual activity between interviews was significantly higher among those who had moved shortly before the first wave (23%) than among those who had not (18%). However, when a wide range of background and psychosocial characteristics were controlled for, having moved was not significantly associated with initiation of intercourse. Rather, relatively poor academic performance and high levels of delinquency among both youth who had moved and their friends in school were predictive of their increased likelihood of beginning sexual activity.

To examine the factors underlying previously established links between residential mobility and adolescents' initiation of premarital sexual activity, researchers analyzed data from Add Health respondents who reported being sexually inexperienced at Wave 1 (conducted in 1994–1995) and had not married by Wave 2 (1996). In addition to teenagers' background characteristics, residential mobility before Wave 1 and sexual behavior, the analyses included measures of their risk behavior, relationship with their parents and psychological well-being; the structure of their school-based social network; and the behavior of the youth in that network. The analytic sample consisted of 4,862 teenagers, of whom 20% first had intercourse between survey waves.

Sixteen percent of respondents had moved within the two years prior to the first interview, and bivariate analyses revealed many differences between these youth and others. They reported a higher prevalence of sexual initiation between surveys (23% vs. 18%) and differed from youth reporting no move on almost all background characteristics studied. Those who had moved were younger than others at Wave 1 (14.3 vs. 14.6 years, on average), were less likely to be white (67% vs. 78%) and to live in a two-parent family (71% vs. 81%), and were more likely to be receiving public assistance (9% vs. 6%) and to report that their parents had recently divorced or separated (7% vs. 3%). They had a higher risk profile than youth who had not moved (as suggested by a lower mean grade point average and less involvement in extracurricular activities), and they scored lower on all three parent-child relationship measures (which reflected quality of the relationship, parents' involvement in their child's life and parents' availability to their child). Measures related to their network structure indicated that they were more isolated from their peers, were less well connected and had less popular friends than teenagers who did not report a recent move. Finally, the friends of youth who had moved had a lower mean grade point average and participated less in extracurricular activities than the friends of other respondents.

In an initial logistic regression model, controlling only for teenagers' background characteristics, youth reporting a recent move at Wave 1 had a significantly elevated likelihood of beginning to have sex by Wave 2 (odds ratio, 1.4). Additionally, the older a teenager was, the greater the likelihood of sexual onset (1.4); the odds declined if the parents were well educated (0.9) and if the teenager lived with both parents (0.5).

Building on this model, the researchers conducted a series of analyses, first adding the different types of measures individually and finally controlling for all of the variables at once. When the model controlled for either parent-child relationship factors, psychological well-being or network structure in addition to background characteristics, the association between a recent move and sexual initiation was unchanged.

However, when the analysis controlled for individual risk behaviors, the relationship was no longer statistically significant. In this model, the lower a teenager's grade point average, the higher the odds of sexual initiation, and the odds were elevated for respondents reporting delinquent behaviors. Similarly, in the model controlling for the behavior of teenagers' friends, youth who had moved shortly before Wave 1 did not have an elevated likelihood of beginning to have intercourse; sexual initiation was positively associated with peers' delinquency and inversely associated with their grade point average.

When all measured factors were controlled for simultaneously, youth reporting a recent move were not significantly more likely than others to have started having sex between surveys. For most background variables, results were similar to those of the initial model. Moreover, the likelihood of sexual initiation remained inversely associated with teenagers' grade point average (odds ratio, 0.8) and was significantly elevated among those who reported that they or their peers engaged in delinquent behaviors (1.2 and 1.1, respectively).

The researchers conclude that the "behavioral composition" of the social networks of teenagers who have moved, as well as these teenagers' own risk behaviors, best explains why they are more likely than others to begin having intercourse. In the analysts' view, the dynamics within "low-performing and relatively delinquent" networks may make it easier for teenagers who have recently relocated to join them than to join higher status groups; this relatively easy entry may lead youth to adopt the behaviors that are prevalent among members of the network, including sexual activity.—*D. Hollander*

REFERENCE

1. South SJ, Haynie DL and Bose S, Residential mobility and the onset of adolescent sexual activity, *Journal of Marriage and Family,* 2005, 67(2):499–514.

Adding a Skills-Based Component to STD Prevention Efforts May Increase Their Success Among Teenagers

Interventions that emphasize STD risk reduction skills may be more effective at lowering the prevalence of risky behaviors and preventing infection among teenage women than programs that simply provide information about how to reduce risk.[1] In a randomized controlled trial conducted in Philadelphia, participants in a skills-based STD prevention intervention reported less unprotected sex one year later than did a control group, who received a general health promotion intervention. They also had a lower STD incidence and reported less involvement with multiple partners and less unprotected sex while drunk or high than controls. Outcomes among young women who received an information-based STD prevention intervention did not differ from those among controls.

The interventions were part of a project designed to lower the risk of health problems among inner-city black and Hispanic teenage women. Using group discussions, videotapes, games and exercises in a single 250-minute session, the STD prevention programs addressed the high rates of HIV and other STDs among black and Hispanic young women, personal vulnerability, substance use, and condom use and negotiation skills. They differed only in that the skills-based intervention had participants practice putting condoms on anatomical models and engage in role-playing exercises to increase condom negotiation skills. The trial was open to sexually experienced, nonpregnant 12–19-year-olds obtaining family planning care at a hospital adolescent medicine clinic.

In all, 682 young women (463 blacks and 219 Hispanics) enrolled. Participants completed a self-administered questionnaire before the intervention, immediately afterward, and at three-, six- and 12-month follow-up visits; they also provided biological specimens for STD testing at enrollment and at the six- and 12-month visits. According to data from the baseline surveys, in the three months before entering the study, 87% of the teenagers had had intercourse, 52% had had unprotected sex and 16% had had multiple partners; two in 10 tested positive for gonorrhea, chlamydia or trichomoniasis at baseline. Women in the three study groups did not differ on these characteristics or on any of a range of variables that might mediate the effects of the interventions.

For the primary outcome measure, the reported number of days on which respondents had had unprotected sex in the previous three months, no differences were observed between groups at the three- and six-month follow-up visits. However, at 12 months, women in the skills-based intervention reported significantly fewer such days (2.3, on average) than those in the information-based intervention (4.0) or in the control group (5.1); the difference between the information-based group and the controls was not statistically significant.

Twelve-month follow-up results also showed that significantly lower proportions of teenagers from the skills-based program than of controls tested positive for an STD (11% vs. 18%) and reported having had multiple partners in the past three months (7% vs. 17%). In addition, the average number of partners in the past three months was lower among the former than among the latter (0.9 vs. 1.0). At the three- and six-month visits, women who had received skills training reported having had sex while high on drugs or alcohol on fewer days than controls. At 12 months, this difference was no longer statistically significant, but the average number of days on which women reported having had unprotected sex while high was lower among skills-based intervention participants (0.1) than among controls (0.5). Again, no significant differences were observed between teenagers in the information-based intervention and controls.

After the intervention, participants from both STD prevention programs displayed greater knowledge than controls about condom use and risk reduction, as well as stronger intentions to use condoms and more beliefs and attitudes that would favor use. Teenagers from the skills-based intervention scored higher than those from the information-based program on knowledge of condom use.

The researchers contend that their study "pro-

vides some of the strongest evidence that enhancing skills should be a critical goal for interventions designed to reduce [risky] sexual behavior." Pointing out that the intervention was delivered in a single session, they add that the results of this trial suggest the potential for effecting "significant long-term changes" in teenage women's sexual behavior "without great expenditure of time and effort."–*D. Hollander*

REFERENCE

1. Jemmott JB III et al., HIV/STD risk reduction interventions for African American and Latino adolescent girls at an adolescent medicine clinic: a randomized controlled trial, *Archives of Pediatrics and Adolescent Medicine,* 2005, 159(5):440–449.

Likelihood That Cesarean May Have Been Unneeded Differs by Women's Race

Eleven percent of primary and 65% of repeat cesarean deliveries performed in the United States in 2001 may not have been clinically necessary, according to an analysis of data from a large, nationally representative database.[1] White women were significantly less likely than blacks to have a primary cesarean that was potentially unnecessary, but the reverse was true for repeat procedures. The likelihood that a cesarean delivery may have been unnecessary also varied by a number of other maternal characteristics, as well as by some hospital characteristics; for a number of factors, associations with primary procedures were in the opposite direction of those for repeat cesareans.

The analysis was based on information from the 2001 Healthcare Cost and Utilization Project National Inpatient Sample database, which contains records of stays in more than 1,000 hospitals in 33 states. All women who had a singleton live birth were included in the calculations. Those who delivered by cesarean were classified according to whether this was their first such delivery or a repeat procedure; if a woman's discharge record did not document any of 24 standard indications for cesarean, the procedure was categorized as potentially unnecessary. Notably, to ensure that their findings were as comparable as possible to those of earlier work, the analysts did not consider previous surgical delivery an indication for cesarean.

Nationwide, the analysts estimate, 540,174 primary and 371,863 repeat cesareans were performed in 2001. Of these, 11% and 65%, respectively, were potentially unnecessary. The descriptive data suggest some degree of variation in these rates by maternal and hospital characteristics. For example, the proportion of primary cesareans that may not have been necessary was as high as 14% among black women and 16% among Medicare recipients; it was as low as 9% among women living in the West. By contrast, black women and Medicare recipients had below-average rates of potentially unnecessary repeat cesareans (62% and 59%, respectively), and the rate reached 70% in rural hospitals and in government-owned facilities. The analysts used multiple logistic regression to explore the characteristics associated with potentially unnecessary cesareans.

In the multivariate analysis, white women, Hispanic women and women of other or unknown ethnicities were significantly less likely than blacks to have a primary cesarean that was potentially unnecessary (odds ratios, 0.7–0.8). Women aged 35 and older had an elevated likelihood of this outcome, as did women who were admitted to the hospital on a weekend (1.1 for each). The odds that a primary cesarean may have been unnecessary were higher among Medicare recipients than among women with private insurance (1.4), and higher among Southerners than among women from the West (1.2).

With repeat cesareans, however, the odds that a procedure was potentially unnecessary were elevated among white women (odds ratio, 1.1), and were reduced among women aged 35 or older (0.8) and those whose hospitalization began on a weekend (0.7). In addition, repeat cesareans performed in rural hospitals were more likely than those done in urban, teaching hospitals to be potentially unnecessary (1.3). Findings at a marginal level of statistical significance suggest a reduced likelihood that procedures performed for women receiving Medicare and those done in private hospitals may not have been necessary, and an increased likelihood for those performed in urban, nonteaching hospitals.

In commenting on the findings, the analysts emphasize that they cannot draw "definitive conclusions about whether the potentially unnecessary cesareans were clinically unnecessary." Nor can they identify the factors—including physicians' preferences, women's preferences and clinical concerns—underlying the racial and other differences observed in the likelihood of potentially unnecessary cesareans. Nevertheless, they conclude that "a large number of cesareans are not supported by documentation of recognized clinical indicators," and that eliminating such procedures would reduce the costs of delivery and the risk of adverse maternal outcomes.–*D. Hollander*

REFERENCE

1. Kabir AA et al., Racial differences in cesareans: an analysis of U.S. 2001 national inpatient sample data, *Obstetrics & Gynecology,* 2005, 105(4):710–718.

Early First Sex May Not Lead to Increased STD Risk During Young Adulthood

Early initiation of sexual intercourse is associated with an increased likelihood of STD infection among teenagers and young adults overall, but the magnitude and strength of the association vary by current age, according to findings from the National Longitudinal Study of Adolescent Health (Add Health).[1] In analyses of data on respondents who provided urine samples for STD testing in Wave 3 of the survey, teenagers who had first had intercourse at an early age were more likely than their peers who had waited to test positive. However, the older the respondent, the less pronounced the difference, and for 24-year-olds, the association was no longer statistically significant. The relationship between age at first sex and STD infection did not vary by other characteristics studied.

To examine long-term associations between age at first intercourse and STD risk, analysts studied data from 9,844 sexually experienced Wave 3 Add Health respondents who provided a urine specimen to be tested for chlamydia, gonorrhea and trichomoniasis. They used multiple logistic regression and included interaction terms to assess whether associations varied among young people with different demographic characteristics.

The sample was evenly divided between males and females; 80% of the young people were white, and 90% were non-Hispanic. Nearly nine in 10 said that at least one parent had a high school or higher education. At the time of Wave 3 (2001–2002), respondents were 18–26 years old; their mean age was about 22 years. On average, they had been about 16 years old when they first had intercourse; one in three had been younger than 16.

Seven percent of respondents tested positive for at least one STD. This group was disproportionately female (58%) and black (51%), and reported a lower level of parental education than did the overall sample. Forty-

six percent of those who had an STD had been younger than 16 at first intercourse. The proportion with an STD declined from about 10% of those who had first had sex at age 12 to about 6% among those who had delayed first intercourse until age 20.

Both current age and age at first intercourse were negatively associated with young people's likelihood of having an STD. Results of the multivariate analysis showed, however, that the older the respondent, the smaller the increase in risk related to age at first intercourse. For example, compared with their peers who had first had sex at age 17, 18-year-olds who had initiated intercourse at age 13 had more than twice the odds of being infected (odds ratio, 2.3), but 24-year-olds who had begun intercourse at age 13 had only a small increase in odds that was not statistically significant (1.1).

Other factors associated with an elevated likelihood of testing positive for an STD were being female (odds ratio, 1.4), being Hispanic (1.8) and being nonwhite (6.0 for blacks and 1.7 for others). Respondents who reported that at least one parent had completed high school or received a postsecondary education had reduced odds of being infected (0.6–0.8). The association between age at first intercourse and the likelihood of having a positive STD test did not differ by these characteristics.

The analysts conclude that "programs that effectively prolong virginity among adolescents make sense as part of a comprehensive strategy for reducing [STDs] among adolescents." By the same token, they emphasize that such programs "will have limited returns in terms of reproductive health among young adults." They suggest that early intercourse, in and of itself, may not be responsible for heightened STD risk among young people, and that different mechanisms may be effective for reducing STD rates in late adolescence and young adulthood.—*D. Hollander*

REFERENCE

1. Kaestle CE et al., Young age at first sexual intercourse and sexually transmitted infections in adolescents and young adults, *American Journal of Epidemiology,* 2005, 161(8):774–780.