First Coitus for Adolescents: Understanding Why and When

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Background: **Correlates of initiation of coitus for teenagers were examined, and participants were asked their reasons for initiating or postponing the onset of coitus.**

Methods: **Questionnaires were completed privately by 218 patients aged 13 to 18 years. Questions explored the reasons adolescents cite for their sexual decisions and the role of peer influence in these decisions.**

Results: **Correlation was noted in young teenagers between perception of peer sexual behavior and participant's initiation of coitus. Reasons stated for engaging in first intercourse reflect both active choices and loss of control. Reasons for refraining included fear of pregnancy and sexually transmitted diseases, lack of developmental readiness and opportunity, and social sanctions. Morality was cited infrequently as a reason for postponing sexual behavior.**

Conclusions: **Results suggest that sexuality education should address the direct and curious questions of younger teenagers about sexuality, help youth define strategies that they can use to evaluate and resist peer pressure, and give more generalized attention to ways of helping youth feel competent. Physicians and other health educators might focus on helping older youth define how and when they know they are ready to have intercourse, consider ways of expressing sexuality that do not jeopardize health, and improve communication skills when talking with friends and potential partners about sexual issues. (J Am Board Fam Pract 1997;10:96-103.)**

Serious health consequences of early onset of coitus among adolescents have been well documented and include adolescent pregnancy, increased exposure to sexually transmitted diseases (STDs)[1] including infection with the human immunodeficiency virus (HIV), and delays in maturation toward healthy adult psychosocial adjustment. In light of these consequences, the *Healthy Youth 2000* objectives[2] include a reduction of pregnancies among adolescents 17 years old and younger to no more than 50 per 1000; a reduction in the proportion of adolescents who have engaged in sexual intercourse to no more than 15 percent by the age of 15 years, with no more than 40 percent by the age of 17 years; an increase in the proportion of adolescents 17 years old and younger who have abstained from intercourse for the previous 3 months; and among sexually active young people, an increase to 90 percent in the number who use contraception and condoms for prevention of pregnancy and STDs. A recent update on progress toward these objectives indicates that in several of the states surveyed, no site had met all of the objectives, and in many areas great numbers of students engage in behaviors that place them at risk for unintended pregnancy and STDs.[3]

The research on adolescent sexual behavior to date has been limited primarily to descriptive studies and has focused primarily on the age of onset of coitus, number of partners, and the use of contraceptives and barrier protection against STDs. This research, some of it on large groups of adolescents, reports consistent findings: a decrease in the age of first coitus among adolescents in the United States, an increasing proportion of adolescents younger than 18 years engaging in sexual intercourse since the 1960s and 1970s, and an increase in STDs among teenagers.[4-6]

Few studies have been conducted that investigate why adolescents choose to initiate or postpone intercourse, and most studies on peer influences have been done with older adolescents.[7,8] The relevance of knowing why they chose to initiate or postpone intercourse is clear in terms of helping guide health education in both the com-

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munity and medical setting. The purpose of our study was to examine the correlates of initiation of coitus for teenagers and to ask study participants about their reasons for either initiating or postponing the onset of coitus. Unlike many previous studies of adolescent sexuality, which have been conducted in school settings, the venue for this study was the family practice office setting where, ideally, there is opportunity for physicians to provide sexuality education that could influence risk behaviors in youth.

Our study addressed the following specific questions:

1. Between the ages of 13 and 18 years, what characteristics differentiate adolescents engaging in first intercourse from those who refrain from initiation of intercourse?
2. Does the perception of peer group sexual activity (both closest friends and acquaintances) correlate with the initiation of sexual intercourse in 13- to 18-year-olds?
3. What reasons do adolescents report for engaging in first intercourse or for remaining virginal?
4. For adolescents who are sexually active, what is the single most important reason reported for initiating intercourse?
5. For those who have initiated coitus, what percentage used contraception during their first sexual intercourse?

Methods

Participants 13 to 18 years old were recruited from adolescents obtaining health care at eight private family practice offices in Michigan. Four sites were rural, four were urban. When adolescent patients arrived for medical appointments, a trained receptionist offered them the opportunity to participate. Parental consent, as well as consent from the participants, was obtained before the questionnaire was distributed. The consent process included assurance of anonymity as well as privacy in completing the questionnaire. Additionally, participants were offered the opportunity to receive feedback on the final results of the study. Approval for the study was obtained from the Human Subjects Review Board of Michigan State University.

Exclusion criteria included previous participation, lack of parental consent, or serious cognitive impairments recorded on the problem list in the chart. Questionnaires were completed privately and anonymously. Data collection took place during a 12-month period. No questionnaires were eliminated from the study because they were incomplete.

To assess comprehensibility, we pilot tested (pilot n = 49) the self-administered questionnaire in populations similar to the proposed study population and in a public health clinic for teenagers that included younger teenagers with below-average academic achievement. All questions were in a multiple-choice format, with the exception of a 5-point Likert scale (1 = not important to 5 = very important) associated with each reason for initiation or noninitiation of sexual intercourse. These items were developed from the literature, from review and selection from national standardized questionnaires (Youth Risk Behavior Survey, National Survey of Family Growth), and from researchers' clinical experience with adolescents.[9] Respondents were also asked to select from the list provided the most important reason for initiating or abstaining from intercourse. During pilot testing, only 1 of the 49 teenagers interviewed had difficulty understanding the use of this scale or the language used to elicit information about sexual attitudes and behaviors.

We focused preliminary data analysis on issues of reliability and validity. The reliability of data acquisition was enhanced by determining that outcome variables and their relation to independent variables were stable across the first and second half of the study period. We assessed construct validity by correlation analysis of related items in the questionnaire. Initial analyses were primarily descriptive, with proportions and means reported with standard error.

After we analyzed the descriptive data, we investigated bivariate relations both in the entire sample and stratified by age and sex. The respondents were characterized as having experienced first intercourse or not. The following variables were compared across the two groups: (1) demographic characteristics, (2) household composition, (3) academic achievement, (4) educational goals, (5) religious affiliation, (6) self-reported religiosity, and (7) age of closest peers. Standard tests for detection of differences in proportions (chi-square) were applied.

In the analysis of reasons for engaging in or refraining from first coitus, we clustered responses

Table 1. Possible Reasons for Having Sexual Intercourse for the First Time or for Refraining From Intercourse.

Possible reasons for having sexual intercourse for the first time
I wanted to be like my friends. (P)
My boyfriend or girlfriend forced me to have sex. (NC)
I wanted to show my love to my boyfriend or girlfriend. (AD)
I was drinking or using drugs. (LC)
I thought sex would make me feel more attractive or lovable. (SE)
I wanted to have a baby. (SE)
I was curious about what sex would feel like. (C)
I got so turned on that it just happened. (LC)
Someone (other than my boyfriend or girlfriend) forced me to have sex with them. (NC)
I decided that it was the right time for me. (P)
Possible reasons for refraining from onset of intercourse
Most of my friends think it's best not to have sex. (P)
I don't think I'm ready to have sex yet. (D)
I'm afraid I might get pregnant (or get someone pregnant). (F)
I'm afraid I might get a sexually transmitted disease (VD) or AIDS. (F)
I'm not interested at this time. (D)
I heard from my friends about problems with having sex. (F)
My parent(s) would disapprove. (MO)
It's against my religious or moral principles. (MS)
I don't have a boyfriend or girlfriend. (D)
My boyfriend or girlfriend doesn't want to, but I want to. (P)
My boyfriend or girlfriend doesn't think it's right to have sex. (MO)

P - peer pressure, NC - forced to have sex, AD - active decision, LC - loss of self-control, SE - maintenance of self-esteem, C - curiosity, D - lack of developmental readiness or opportunity, F - fear of pregnancy, sexually transmitted disease, or human immunodeficiency virus infection, MO - morality of others, MS - own morality.

into categories with common behavioral threads (Table 1).

Results

Table 2 summarizes the composition of the group of 218 participants in the study. For another 19 adolescents, 2 parents declined consent, 5 adolescents declined consent, and 12 adolescents were at the office without a parent to provide consent, yielding an overall response rate of 92 percent. There were more older (15 years and older) than younger participants in this study.

Overall, 39.4 percent of the respondents reported having had intercourse (n = 86), and there was a strong positive relation between age and the proportion that reported initial intercourse. The greatest rate of change in the prevalence of initiation of coitus was between 14 and 15 years of age, with a maximum prevalence of initiation of intercourse of almost 90 percent in 18-year-olds. The self-reported age of first intercourse ranged from 11 to 18 years old, the upper age limit for participants recruited to this study. Among those who reported having intercourse, the average age of first coitus was 14.9 ± 0.2 years, and more than 50 percent of the sexually active adolescents were 15 years old or younger when they had intercourse for the first time. None of the respondents reported engaging in first intercourse with a partner of the same sex.

Characteristics That Differentiate Adolescents Engaging in First Intercourse From Those Who Refrain From Intercourse

The characteristics distinguishing adolescents engaging in first intercourse and their relative risks are presented in Table 2. Factors significantly correlated with those youth who had experienced intercourse, compared with those who had not yet had intercourse, included being a girl, older age, living independently from parents or guardian, lower school performance, less advanced educational plans, and older best friends. After stratifying by age, however, the sex of the participant was no longer significantly associated with first intercourse. There was no significant relation between maternal education and age of first coitus of their children. Variables such as school performance were, of course, measured after initiation of intercourse and could have

Table 2. Characteristics Distinguishing Adolescents Engaging in First Intercourse.

Characteristics	No. (%)	Prevalence of First Coitus No. (%)	Relative Risk	χ^2	*P* Value
Sex					
Female	133 (61)	61 (46)	1.0		
Male	85 (39)	25 (30)	1.4	4.0	0.047*
Age, years					
< 15	87 (40)	3 (3)	1.0		
≥ 15	129 (60)	79 (61)	20.7	75.3	0.001
Race					
Nonwhite	39 (18)	19 (49)	1.0		
White	172 (82)	64 (37)	1.3	1.9	NS
Social status					
Lower	70 (33)	30 (43)	1.2		
Middle	73 (35)	27 (37)	1.0		
Upper	68 (32)	29 (43)	1.2	0.9	NS
Household composition					
Two parents, guardians	161 (75)	52 (32)	1.0		
Single parent, guardian	35 (16)	13 (37)	1.2		
No parent	18 (9)	17 (94)	2.9	26.5	0.001
School performance (self-rated)					
Lower	95 (47)	51 (54)	1.0		
Higher	115 (53)	31 (27)	2.0	15.6	0.001
Educational plan					
College degree or more	50 (24)	16 (33)	1.0		
Some college or less	160 (76)	86 (54)	1.6	7.0	0.008
Importance of religion					
More	144 (68)	50 (35)	1.0		
Less	69 (32)	31 (45)	1.3	2.1	NS
Religious affiliation					
None claimed	19 (10)	9 (47)	1.9		
Protestant	58 (31)	23 (40)	1.6		
Fundamentalist	32 (17)	13 (41)	1.6		
Catholic	76 (41)	19 (25)	1.0	5.6	NS
Best friends					
Same age	183 (86)	60 (33)	1.0		
At least 2 years older	29 (14)	21 (72)	2.2	16.6	0.001
Maternal education					
College degree or more	65 (31)	28 (43)	1.2		
Some college or less	144 (69)	53 (37)	1.0	0.7	NS

* Not significant when adjusted for age.
NS - not significant

changed during the months or years since the adolescent's first intercourse. These variables, although showing strong correlations, cannot be interpreted as predictive.

Perception of Peer Group Sexual Activity and Initiation of Coitus

To address the second question in this study, we examined the relation between the adolescents' perception (regardless of whether this perception was valid) of peer group sexual experience and the onset of coitus. Analysis of this data is difficult because perceptions were based on recall of several years past in the older age groups and because the adolescents, by the age of 17 to 18 years, uniformly perceived their peer group to be sexually experienced.

Among younger adolescents who were sexually active, however, a much higher percentage of them also believed their peers to be sexually active. This perceptual correlation is much stronger for younger teenagers (Table 3). For example, compared with those who believed that none of their friends was sexually active, those 13- and 14-year-olds who believed a few or some of their best friends had had first intercourse were six times as likely to have initiated intercourse. Those 13- to 14-year-olds who believed many or all of their peer group to be sexually active were more than 20 times as likely to have had their first coital ex-

Table 3. Percentage of Participants Reporting Perceived Sexual Activity Among Same-aged Peers, by Age and Sexual Status.

Perceptions of Sexual Activity	Status at 13-14 Years		Status at 15-16 Years	
	Virginal (n = 157)	Have Had Intercourse (n = 31)	Virginal (n = 151)	First Coitus at Age 15-16 Years (n = 28)
Friends who are sexually active at same age				
None	45.9	6.4	14.0	2.7
Few or some	48.4	48.4	68.4	54.0
Many or all	5.6	45.1	17.5	44.3
χ^2 *P* value	0.0001		0.0322	
Acquaintances who are sexually active at same age				
None	13.2	0.0	0.0	0.0
Few or some	75.5	71.5	65.0	34.2
Many or all	11.2	28.5	35.0	65.8
χ^2 *P* value	0.005		0.0234	

perience. As the adolescents aged, the perception of sexual activity among their peers increased considerably. By the time participants were 17 and 18 years old, they perceived their peers to be almost universally sexually active, so little comparison of perceived peer sexual behavior versus reported participant sexual behavior is possible.

Why Adolescents Engage in First Intercourse or Remain Virginal

The most common reasons respondents gave (cited more than 50 percent of time with mean Likert score of 3 or higher) for either initiating or refraining from their first intercourse are listed in Table 4. In general, the most frequently reported reasons for engaging in first intercourse reflect both active choices (eg, love, curiosity) and loss of control. Fear, lack of developmental readiness, and social disapproval dominate the reasons these adolescents report refraining from first intercourse. When stratified by age at first intercourse, the motivation for teenagers younger than 15 years old to have first intercourse tended to be curiosity about sex (mean Likert score of 3.5), loss of self-control (3.1), to show love (3.0), and a feeling that it was the right time (3.0).

Table 4. Self-reported Important Reasons for Engaging in or Refraining From First Intercourse.

Reasons	Percent
Engaging in sex	
Love for boyfriend or girlfriend	78
Curious about what sex is like	72
It was the right time	70
Loss of control	53
Refraining from sex	
Fear of STD, HIV	89
Fear of pregnancy	88
Not ready yet	86
Perceived parental disapproval	67
Not interested at this time	65
No girlfriend or boyfriend at this time	56
Girlfriend or boyfriend disapproves of sex	55

STD - sexually transmitted disease, HIV - human immunodeficiency virus.

Overall, teenagers not having had intercourse endorse their explanations more strongly in terms of mean Likert scores than do teenagers endorsing explanations for having intercourse. Older adolescents were somewhat less strong than the younger adolescents in their endorsement of reasons for delaying intercourse (2.97 vs 3.18 overall), as evidenced by the mean Likert scores for each reason (a sense of inadequate readiness, lack of interest, parental disapproval). Personal morality was not a major influence on their decisions to either initiate or postpone first sexual intercourse.

Single Most Important Reason Reported by Adolescents for Initiating or Refraining From Intercourse

Participants also selected the single most important reason for engaging in or refraining from first intercourse (Table 5). When these reasons are considered as broad categories (Table 1), the role of active decision making and the lack of developmental readiness were most commonly reported. Reported differences by age are also apparent. Among adolescents younger than 15 years at the time of first intercourse, 16 percent reported peer pressure and 8 percent reported self-

esteem as the most important reasons for having first intercourse. Peer pressure and self-esteem were less frequently cited as the most important reasons for first intercourse among older teenagers; nevertheless, 14 percent of older teenagers reported that they were forced to have sex for the first time. No differences were observed by age for respondents' reasons for not yet having first intercourse.

When considering sex differences and similarities, both boys and girls tended to report that active decision making, loss of self-control, and peer pressure were important; however, boys were much more likely to report the latter two reasons, whereas 12 percent of girls reported that first intercourse was nonconsensual and another 6 percent reported that intercourse was undertaken to enhance their self-esteem. Although fear (of STDs, HIV infection, or pregnancy) was more common among boys not initiating sexual activity, developmental explanations were more frequently cited by girls in the same situation. This finding is especially noteworthy because in this study population the girls were older than the boys. The two sexes differed little in their reference to morality, which was cited infrequently as a reason for delaying first intercourse.

Use of Contraception With First Intercourse

Sixty-four percent of those respondents who have had intercourse reported using some form of contraception with their first sexual intercourse. The mean age of those teenagers who used any contraceptive method with first intercourse (15.1 ± 0.2 years) was 8 months older than the mean age of those who did not use any birth control (14.4 ± 0.3 years), $P < 0.05$.*

Discussion

The findings in this study are consistent with those of other research that show many adolescents are sexually active by the age of 15 years, with the great majority having had intercourse by the age of 18 years.[4,10-12] The most recent National Survey of Family Growth data (for 1988) indicate that 72 percent of white and 75 percent of African-American adolescents have had intercourse at least once by the age of 18 years, with 25 percent of this number having first intercourse prior to the age of 15 years[4]; and the 1993 Centers for Disease Control findings are consistent with these data, indicating overall that 70 percent of boys and 67 percent of girls have had intercourse by midway through their senior year in high school.[6]

*While this question was not central to this study, the researchers included it because of the important message it conveys to youth and because it also serves as an internal validity check when the results are consistent with other research findings, as they are in this case.

Table 5. Self-reported Most Important Reason by Category for Engaging in or Refraining From First Intercourse.

Reason	Percent
Engaging in sex	
Active decision	56
Loss of self-control	19
Peer pressure	12
Forced to have sex	9
Maintenance of self-esteem	4
Refraining from sex	
Lack of developmental readiness or opportunity	48
Fear of pregnancy, STD, HIV	37
Own morality	12
Morality of others	3

STD - sexually transmitted disease, HIV - human immunodeficiency virus.

The reported use of contraception with first intercourse is consistent with data from recent studies indicting that educational efforts which encourage youth to protect themselves from unintended pregnancy and STDs have had some impact on behavior.[5,13,14] Again, consistent with findings of other studies is our finding that those youth who engage in their first coitus at a young age are less likely to use contraception than are those adolescents who are older.[15] Distinguishing characteristics of adolescents engaging in intercourse also match other research findings, with one notable exception: there was no correlation between educational level of the mother and those youth who were sexually active at an early age, as has been reported by other research.[16,17]

The central questions that prompted this research resulted in findings which could have implications for health care professionals who interact with youth in clinics and office settings, for parents discussing sexuality in the home, and for the design of sexuality education programs for youth. It has been shown in several studies[7,8] that accurate information, in and of itself, does not insure decisions about sexual behavior that protect

health. Our finding that sexually active young adolescents were more likely than were virginal young adolescents to perceive their peer group as sexually active might mean that a clinician who asks the patient about sexual activity among peers* could discover a useful indicator for the likelihood of onset of coitus in the patient. Our finding that perception of peer sexual experience correlates highly with onset of coitus in young adolescents makes intuitive sense, given the developmental importance in early and middle adolescence of peer approval and the influence of peer social relationships on risk-taking behavior.

The reasons articulated in this research for initiation of coitus or maintenance of abstinence might also inform our approach to discussions with youth about sexuality issues. The more frequent reporting of loss of self-control by boys is consistent with societal stereotypes about male sexual expression, as is the more frequent reporting by girls of coital initiation to enhance self-esteem. What is not supported in the theoretical literature on sex differences in adolescents is the more frequent reporting of peer pressure by boys as an important reason to have first intercourse.

If younger adolescents report having intercourse because of curiosity, loss of control, peer pressure, and to enhance self-esteem, then discussion by physicians and parents focused on some or all of these issues is relevant. As others have suggested in conceptual models, programs that address the direct and curious questions of young people about sexuality in relationships can be useful, programs that help youth define strategies for themselves to evaluate and resist peer pressure should be helpful to some adolescents, and more generalized attention to ways of helping youth feel competent might result in intercourse not being used as a bargaining tool for acceptance and love and to enhance self-esteem.[18] With older adolescents, because many of them report making active choices to have intercourse for reasons sanctioned by our society (eg, love, readiness), sexuality educators and health care providers might well focus on helping youth in this age group consider how they know when they are ready to have intercourse, to consider ways of expressing sexuality that do not jeopardize health, and to improve communication skills in talking with friends and potential partners about sexual issues.

It would appear, from the reasons reported by youth for remaining celibate and from the higher rate of contraceptive use with first intercourse than was true 10 years ago, that educational programs about STDs and acquired immunodeficiency syndrome (AIDS) might be having some impact on behavior.[19] Again, translating information about STDs and pregnancy into positive behavioral choices is a challenge for sexuality educators, parents, and physicians alike. The finding that youth who chose not to have intercourse were more sure of their reasons (with a higher mean Likert score for stated reasons) than those who had intercourse, again, seems intuitively to make sense, particularly if these youth perceived themselves to be in a minority compared with their peers.

The limitations of this study illustrate some of the challenges in doing research on sensitive subjects with adolescents. Access to population, the need for parental consent, and studies that rely on recall, all can bias results. This population came from primary care offices and cannot be assumed to be generalized to the entire population, although the data on sexual activity and use of contraception are consistent with large school-based studies in this population. Because the participation rate was 92 percent (a rate that is much higher than in school-based research) despite the need for parental consent, the consent issue does not bias the results more than with other large studies. Finally, it should be noted that when an adolescent states his or her reasons for having first intercourse, these statements reflect the recall of one discrete episode of decision making. On the other hand, refraining from the initiation of coitus is an on-going process, and reported reasons reflect this sustained decision making and are less subject to memory.

A final finding of this study suggests that data collection on sensitive issues is indeed possible in primary physicians' offices, which, in fact, provide a good setting in which to do research. Such research in a clinical setting offers the opportunity to follow up with the patient in conversation, if requested, to report findings to adolescents in the form of a personal letter (as was done in this study), and to encourage continued conversation in the health care setting about issues that impact

*A question such as, "Tell me how you think your friends are handling the decision about sexual involvement with their boyfriends or girlfriends."

health. The ease with which parental consent for participation was obtained indicates that parents appreciated and expected the involvement of health care professionals in helping with sexuality education in the clinical setting. The trust placed in a physician-patient relationship offers a unique opportunity to reinforce learning that is begun in homes and schools.

References

1. Shobino DM, Hofferth SL. The health and medical consequences of adolescent sexuality and pregnancy: a review of the literature. In: Hofferth SL, Hayes CO, editor. Risking the future, vol. 2: adolescent sexuality, pregnancy and childbearing. Washington, DC: National Academy Press, 1987.
2. Healthy youth 2000: national health promotion and disease prevention objectives for adolescents. Chicago: American Medical Association, 1990.
3. Selected behaviors that increase risk for HIV infection, other sexually transmitted diseases, and unintended pregnancy among high school students—United States, 1991. MMWR Morbid Mortal Wkly Rep 1992;41:945-50.
4. Premarital sexual experience among adolescent women—United States, 1970-1988. MMWR Morbid Mortal Wkly Rep 1991;39:929-32.
5. Sexual behavior among high school students—United States, 1990. MMWR Morbid Mortal Wkly Rep 1992;40:885-8.
6. Kann L, Warren CW, Harris WA, Collins JL, Douglas KA, Collins ME, et al. Youth risk behavior surveillance—United States, 1993. MMWR CDC Surveill Summ 1995;44:1-56.
7. American teens speak: sex, myths, tv, and birth control: the Planned Parenthood poll. New York: Louis Harris and Associates, 1986.
8. Leigh B, Morrison DM, Trocki K, Temple MT. Sexual behavior of American adolescents: results from a U.S. national survey. J Adolesc Health 1994;15: 117-25.
9. Howard M. Delaying the start of intercourse among adolescents. Adolesc Med 1992;3:181-93.
10. Sonenstein FL, Pleck JH, Ku LC. Levels of sexual activity among adolescent males in the United States. Fam Plann Perspect 1991;23:162-7.
11. Orr DP, Beiter M, Ingersoll G. Premature sexual activity as an indicator of psychosocial risk. Pediatrics 1991;87:141-7.
12. Orr DP, Wilbrandt ML, Brack CJ, Rauch SP, Ingersoll GM. Reported sexual behaviors and self-esteem among young adolescents. Am J Dis Child 1989; 143:86-90.
13. Sexual risk behaviors of STD clinic patients before and after Earvin "Magic" Johnson's HIV-infection announcement—Maryland, 1991-1992. MMWR Morbid Mortal Wkly Rep 1993;42:45-8.
14. Gillmore MR, Butler SS, Lohr MJ, Gilchrist L. Substance use and other factors associated with risky sexual behavior among pregnant adolescents. Fam Plann Perspect 1992;24:255-61.
15. MacDonald NE, Wells GA, Fisher WA, Warren WK, King MA, Doherty JA, et al. High-risk STD/HIV behavior among college students. JAMA 1990; 263:3155-9.
16. Zabin LS. Adolescent pregnancy: the clinician's role in intervention. J Gen Intern Med 1990;5:581-8.
17. Shafer MA, Boyer CB. Psychosocial and behavioral factors associated with risk of sexually transmitted diseases, including human immunodeficiency virus infection, among urban high school students. J Pediatr 1991;119:826-33.
18. Jay MS, DuRant RH, Litt IF. Female adolescents' compliance with contraceptive regimens. Pediatr Clin North Am 1989;36:731-46.
19. Hingson R, Strunin L, Berlin B. Acquired immunodeficiency syndrome transmission: changes in knowledge and behaviors among teenagers, Massachusetts statewide surveys, 1986 to 1988. Pediatrics 1990;85:24-9.