

Risk and Protective Factors for Unprotected Intercourse Among Rural African American Young Adults

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SYNOPSIS

Objectives. Despite increasing risk for human immunodeficiency virus (HIV) and other sexually transmitted infections (STIs), few data are available concerning the factors associated with risky sexual behavior among African American young adults who do not attend college. Additionally, the possibility that different risk mechanisms affect men and women remains understudied. This article reports on the risk and protective factors associated with unprotected intercourse and gender differences in these factors' influence among this group. Predictors were derived from ecological and self-regulatory theories of risk behavior.

Methods. African Americans aged 18–21 years were recruited via respondent-driven sampling (RDS) from seven contiguous rural counties. Risk and protective factors for unprotected intercourse were analyzed for 214 of 292 participants who reported sexual intercourse during the past three months.

Results. Among sexually active participants, 62.6% used condoms inconsistently. The influence of leaving the parental home, perceived discrimination, risk-taking peers, family relationships, risk-taking propensity, and binge drinking on unprotected intercourse were moderated by gender. Positive attitudes toward condom use were associated with less unprotected intercourse controlling for the influence of risk variables for both men and women.

Conclusions. Men and women have unique STI prevention needs. Additional research addressing these needs is necessary, particularly for rural African American men.

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Each year in the United States, approximately 25% of sexually active young adults contract sexually transmitted infections (STIs), including human immunodeficiency virus (HIV).^{1,2} African Americans experience disproportionately high rates; they are nearly 20 times as likely to be infected with HIV than are young adults in any other racial group.³ HIV is transmitted through unprotected heterosexual intercourse in approximately 20% of infections among men and more than 50% of infections among women.^{2,4} African Americans are particularly vulnerable during the years following high school, when STI prevalence rates increase dramatically¹ and young people experience pervasive social role changes.⁵ During this transitional period, African Americans have heightened susceptibility to negative health and developmental outcomes.^{6,7}

Despite the risks that unprotected intercourse pose to all African American young adults, research has focused primarily on high-risk groups (e.g., drug users and men who have sex with men), college students, and young adult women.⁸⁻¹⁴ Neither high-risk samples nor those comprising college students generalize to many African American young adults, and studies that include only women preclude adequate investigations of gender differences in risk and protective processes.

Understanding gender differences in the risk and protective processes that influence sexual activity is crucial to the development of effective interventions. Extant research that focuses mainly on adolescents suggests that risk factors for unsafe sex vary by gender. For example, the influences of substance use, peers, and self-regulation on adolescent sexual behavior vary by gender.¹⁵⁻¹⁷ Studies of gender differences in risk processes among adolescents, however, yield inconsistent findings and provide limited guidance for the development of programming for young adults, whose life situations differ from those of adolescents.

The present research was designed to address this gap. We focused on heterosexual intercourse, the primary source of risk for most young adults. We also focused on a particularly understudied population. African American young adults living in rural communities experience considerable economic and social challenges. Fewer than 20% will complete secondary education programs,¹⁸ and resource-poor rural environments provide few opportunities for developing beneficial life paths. These stressors are aggravated by racial discrimination.¹⁹ Such environments may increase young adults' vulnerability to high-risk sexual behavior.²⁰

BACKGROUND

Risk factors

The selection of risk processes was guided by ecological theory, which emphasizes community, family, and peer contexts that influence proximal intrapersonal processes and behaviors.²¹ Community factors include crime, poverty, and disorganization that have been linked with early sexual activity; unprotected intercourse; and STI prevalence in samples of African American adolescents.²² Disorganized, stressful neighborhoods may compromise individuals' future goals and sense of efficacy for achieving them.²³ This undermines planful behavior and concern for future consequences, aspects of self-regulation that support engagement in safer sexual behavior.¹⁷ Gender differences have been noted in adolescents' sensitivity to community disadvantage. Some studies found stronger effects on sexual behavior among women,²⁴ whereas others found stronger effects on men's behavior.²⁵ Racial discrimination, a community-level stressor for rural African Americans, escalates during adolescence.¹⁹ Although few studies assess racial discrimination and sexual risk, discrimination in adolescence is linked with African Americans' substance use,²⁶ a known precursor of risky sexual behavior.

Other ecological studies have identified influences in family and peer contexts that consistently predict early sexual debut and unprotected sex among adolescents.²⁷ Families affect youth risk behavior through various mechanisms including internalization of conventional norms and attitudes,²⁸ development of self-regulation,²⁹ education from parents about sexuality,³⁰ and limitations on affiliations with risk-taking peers. Peers constitute a potent proximal influence, providing opportunities and reinforcement for risk behavior.³¹ Gender differences are apparent in studies with adolescents. For example, Rodgers found that maternal psychological control was linked with sexual behavior among adolescent daughters but not sons.³² Similarly, research suggests that young women may be more influenced than young men by peers.¹⁶

Intrapersonal risk processes investigated included self-regulation, risk-taking tendencies, negative emotions, and substance use. Self-regulation and risk-taking tendencies are distinct aspects of executive functioning that have been linked to sexual risk behavior in adolescence.¹⁷ Self-regulation affects the planning and intentional behaviors required to engage in protected intercourse. Evidence from studies with adolescents is inconsistent regarding gender differences; one study shows that self-regulation more strongly predicts boys' risky sexual behavior,¹⁵ whereas another shows that it more strongly predicts girls' behavior.¹⁷ Men tend

to score higher on scales of risk-taking propensity,³³ though the relative influence of this risk factor on people of different genders is not clear. Negative emotions, such as depression, have been linked with risky sexual behavior among women,³⁴ but less often with such behavior among men. Depressive symptoms can interfere with women's ability to insist on protective behaviors and avoid risk-taking partners.³⁵ Anger and hostility are more reliably associated with both men's and women's behavior.³⁶ Among rural African Americans, anger, particularly arising from stressful developmental transitions and resource-poor contexts, may affect young people's planning for the future and motivation to care for themselves.¹³ Anger, hostility, and depression all can undermine judgment and the self-regulation required for protective behavior.³⁷

Alcohol and marijuana use are well-established correlates of sexual risk behaviors.³⁸ These substances impair judgment, rendering adolescents more willing to have sexual intercourse and less likely to take necessary precautions while under their influence.³⁹ They also are associated with opportunities for risky behavior and affiliations with risk-taking peers.³¹ In some samples, the association between current substance use and risky sexual behavior differs by gender.⁴⁰

Protective factors

We examined the protective influence of several variables hypothesized either to (1) reduce the likelihood of unprotected intercourse controlling for the influence of risk or (2) ameliorate the influence of risk factors on unprotected intercourse. Sexual risk communication between youth and parents has been linked to protected sexual activity in adolescence and young adulthood.^{27,41} Because the presence of nonfamilial older adults has been identified as a potential protective factor in the lives of African American young adults,⁴² we also considered the protective influence of sexual risk communication between a young adult and an "informal mentor." We conjectured that young adults who had goals for their lives and plans for achieving them would avoid unprotected intercourse and that such plans may protect higher-risk young adults.⁴³ Finally, we hypothesized that positive attitudes toward condom use would deter unprotected intercourse.⁴⁴

METHODS

From February 2007 to February 2008, we recruited a community sample of 292 African American young adults from seven counties in central Georgia. The counties were selected purposefully based on contiguity, rurality ($\geq 50\%$ census-defined rural tracts), and

poverty rates among African Americans that exceeded the state average. Self-identified African Americans aged 18 to 21 years who were not attending high school or enrolled full-time in a four-year college or university were eligible to participate.

Participants were recruited via respondent-driven sampling (RDS),⁴⁵ a form of systematically implemented "snowball" sampling. In each county, African American community liaisons recruited two to four initial "seed" participants. Each seed was given three coupons to be used in referring others to the study. Each coupon bore a brief description of the project, the eligibility criteria, a tracking number, and a toll-free telephone number. Interested people called our research center to be screened for eligibility; those who were eligible were scheduled for an interview at home or a convenient community location. The recruiting participant received \$20 for each eligible person who enrolled in the study. Although its effectiveness vis-à-vis random sampling is unclear, an advantage of RDS is that sufficiently long recruitment chains yield samples with characteristics that are not determined by those of the initial seeds;⁴⁶ the point at which this occurs is called the equilibrium distribution. RDS analyses of this sample confirmed that equilibrium occurred within five waves (Unpublished data. Kogan SM, Chen YF, Wejnert C, Brody GH. Implementation and effectiveness of respondent-driven sampling in the recruitment of African American emerging adults. Athens [GA]: Center for Family Research, University of Georgia; 2009).

In addition to the referral incentives, each participant received \$50 for completing the computerized survey. We obtained informed consent from all participants following a protocol that was approved by the university's Institutional Review Board. The study operated under a federal certificate of confidentiality issued by the U.S. National Institute on Drug Abuse.

Procedures

We collected data via audio computer-assisted self-interviews at participants' homes or other settings that they considered more convenient (e.g., the local library). African American field researchers set up the computers, guided the participants through a brief tutorial on using the system, and remained available to assist with technical problems.

Measures

Demographic variables. Participants reported their gender, employment status (unemployed, part-time employment, or full-time employment), and residence within or outside the parental home.

Community factors. We assessed community problems with a subscale of the Community Resources and Problems Measure.⁴⁷ Participants rated the extent of 13 problems in their communities, such as vandalism, gangs, drug use, social isolation, and a lack of jobs and job training (mean [M] = 16.8, standard deviation [SD] = 7.4, $\alpha=0.92$). We assessed perceived discrimination with the Racist Hassles Questionnaire, an eight-item measure our research group developed in conjunction with focus groups of rural African Americans. Participants identified the forms of discrimination most common in their rural communities (e.g., “How often have you been treated rudely or disrespectfully because of your race?”; M=12, SD=5, $\alpha=0.90$).

Family and mentor factors. Negative parent-young adult relationships were assessed with the Family Support Inventory⁴⁸ (e.g., “I can share my feelings with my parent”; M=39.8, SD=10.1, $\alpha=0.94$) and an eight-item adaptation of the Ineffective Arguing Index,⁴⁹ modified with feedback from focus groups of rural African Americans (e.g., “You and your parent’s arguments are left hanging and unsettled”; M=24.5, SD=6.3, $\alpha=0.71$). The scales were significantly correlated ($r=-0.55$, $p<0.0001$); thus, we reverse-coded the support measure and aggregated the scales. Participants completed a scale indicating frequency of communication with the primary parent figure and an informal mentor regarding risky sexual behavior¹⁰ (e.g., “In the past six months, how often have you and your parent talked about the importance of using condoms?”; M=10.1, SD=4.0, $\alpha=0.89$).

Peer risk factors. We assessed peer risk-taking behavior with a 10-item scale (e.g., “During the past 12 months, how many of your friends have gotten high using drugs of some kind?”; M=15.4, SD=3.7, $\alpha=0.84$) drawn from items developed by Elliot et al.⁵⁰

Perceived monogamy. Past research indicates that partners’ perceptions of relationship monogamy increase the likelihood of unprotected intercourse.²⁴ This dichotomous variable (yes/no) was developed from three questions: “Do you have a primary partner?”; “During your relationship with your main partner, have they had sex with someone else?”; and “Do you have a casual sexual partner?”. Participants who reported that they had a primary partner, that the primary partner had not had sex with anyone else, and that they did not have a casual partner were coded “yes” for perceived monogamy.

Intrapersonal processes. We assessed poor self-regulation using the 10-item poor self-regulation subscale (e.g., “I don’t notice the effects of my actions until it’s too

late”; M=19.9, SD=5.2, $\alpha=0.85$) of the Self-Regulation Questionnaire.⁵¹ Risk-taking was assessed with a seven-item scale that Joe et al.⁵² developed for substance-using populations. Exploratory factor analyses revealed two orthogonal factors: high and low risk-taking tendencies. The four-item high risk-taking tendencies subscale (e.g., “You like to do things that are strange and exciting”; M=10.9, SD=3.3, $\alpha=0.79$) was used in this study. Hostility was assessed with an eight-item scale also developed by Joe et al.⁵² (e.g., “You have a hot temper”; M=17.2, SD=7.6, $\alpha=0.89$). Depressive symptoms were assessed with the 20-item Center for Epidemiologic Studies Depression Scale⁵³ (e.g., “During the past seven days, how often did you feel depressed?”; M=14.8, SD=8.4, $\alpha=0.79$). Planful goal orientation, a protective factor, was assessed with the State Hope Scale⁵⁴ (e.g., “I can think of many ways to reach my current goals”; M=23.1, SD=3.8, $\alpha=0.81$).

Substance use. We assessed substance use with dichotomized assessments of binge drinking (four or more drinks at one sitting) and marijuana use during the past month.

Condom attitudes. Participants completed the six-item positive attitudes subscale of St. Lawrence’s Condom Attitudes Scale⁴⁴ (e.g., “I wouldn’t mind if my partner brought up the idea of using a condom”; M=20.0, SD=4.9, $\alpha=0.81$).

Unprotected intercourse. Participants reported the number of times they had vaginal or anal intercourse during the past three months and the number of times a condom was used. Episodes of unprotected intercourse constituted the criterion variable.

Plan of analysis

Although RDS is known to attenuate biases that may occur in studies with chain-referral sampling,⁵⁵ geographical clustering may affect the estimation of standard errors. We examined county-level effects on respondent gender, episodes of unprotected intercourse, perceived discrimination, and community problems with intraclass correlations. For each variable, less than 6% of the variability was explained by participants’ county of residence. We therefore analyzed the data at the individual level. We examined risk and protective factors for unprotected intercourse with negative binomial regression models, as the distribution of the outcome had greater variability than expected under a Poisson distribution.⁵⁶ Participants’ perceptions of relationship monogamy were controlled in all analyses. Main effect and gender interactions were examined for each risk factor. Subsequently, we created risk factor

indices for men and women, and then examined the main and interactive influences of protective factors.

RESULTS

Descriptive analyses

The sample included 175 (59.9%) women and 117 (40.1%) men. Approximately one-third lived in their parents' home. The majority (57.6%) were unemployed; 14.7% worked part time and 27.7% worked full time. Most (86.7%) were not attending school either part time or full time. A little more than one-third were parents. Each participant identified a "primary caregiver while growing up" to reference when responding to family-related questions. In most cases, the primary caregiver was the biological mother (81.5%), followed by a grandmother (9.2%), the father (3.1%), or someone else (6.2%). Each participant also indicated whether or not he or she felt close to a supportive nonparental adult and referenced this person when completing mentor-related questions. Of the 292 participants, 85% reported having a mentor.

Of the sample, 18.8% reported that they had never had sex, 7.5% reported having had sex but not during the past three months, 46.2% reported being sexually active during the past three months and using a condom every time they had sex, and the remaining 27.4% reported having had sex during the past three months and using condoms inconsistently or never. Analyses of risk and protective factors focused on the 214 participants who reported sexual activity during the past three months.

Risk variable analyses

Main effects ($p < 0.05$) on unprotected intercourse (Table 1) emerged for community problems, negative parent-young adult relationship, affiliation with risk-taking peers, poor self-regulation, high risk-taking tendencies, depressive symptoms, hostility, and marijuana use. Binge drinking emerged as a marginal main effect ($p < 0.10$). Significant interaction effects emerged for living arrangements, perceived discrimination, negative family relationships, risk-taking peers, and risk-taking propensity. A marginal interaction emerged for binge drinking ($p < 0.10$).

Table 1. Predictors of unprotected intercourse: negative binomial regression of main effects and gender interactions in a study of rural African American young adults living in central Georgia (n=292), February 2007 to February 2008^a

Risk factors	Main effect		Gender X	Male		Female	
	OR (95% CI)	P-value	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
Demographics							
Male	0.84 (0.63, 1.13)	0.255	NA				
Unemployed	0.92 (0.66, 1.29)	0.638	0.372				
Left home	1.17 (0.87, 1.56)	0.306	0.044	1.75 (1.07, 2.86)	0.026	1.04 (0.36, 1.35)	0.925
Perceived monogamy	1.05 (0.79, 1.39)	0.786	0.767				
Community							
Community problems	1.03 (1.01, 1.05)	0.007	0.249				
Perceived discrimination	1.01 (0.98, 1.05)	0.343	0.003	1.06 (1.01, 1.11)	0.013	0.96 (0.92, 1.01)	0.082
Family and peers							
Negative relationship with parent	1.09 (1.02, 1.17)	0.017	0.004	0.89 (0.75, 1.06)	0.190	1.13 (1.02, 1.24)	0.016
Risk-taking peers	1.07 (1.02, 1.12)	0.002	0.033	1.03 (0.97, 1.10)	0.307	1.14 (1.06, 1.22)	<0.001
Intrapersonal							
Hostility	1.07 (1.05, 1.09)	<0.0001	0.263				
Depressive symptoms	1.03 (1.01, 1.04)	0.003	0.254				
Poor self-regulation	1.03 (1.01, 1.06)	0.034	0.145				
Risk-taking	1.07 (1.02, 1.12)	0.004	0.038	1.14 (1.05, 1.23)	0.001	1.06 (1.00, 1.13)	0.044
Substance use							
Binge drinking	1.41 (0.98, 2.02)	0.062	0.078	1.92 (1.15, 3.22)	0.013	0.99 (0.62, 1.58)	0.988
Marijuana use	1.59 (1.12, 2.25)	0.010	0.261				

^aMain effects by gender are presented for predictors with a significant gender interaction.

OR = odds ratio

CI = confidence interval

NA = not applicable

We conducted separate analyses by gender on these risk factors. Leaving the parental home was positively associated with unprotected intercourse among men but not women. Perceived discrimination had opposite effects on men and women. Perception of more discrimination predicted more unprotected intercourse among men ($p < 0.05$) but less among women, although this effect was marginal ($p < 0.082$). Negative relationships with parents and affiliations with risk-taking peers were significant risk factors only for women. Risk-taking propensity was a significant predictor for both genders, but was stronger among men than women. Finally, past-month binge drinking was a predictor for men only.

Constructing risk factor indices and analyzing protective factors

We constructed separate risk factor indices for men and women, as follows. Continuous variables were recoded based on a median split to indicate the absence (0) or presence (1) of the risk factor; the number of risk factors present constituted the risk factor index. For men, the index (range = 0–9; $M = 4.49$, $SD = 2.28$) comprised leaving the parental home, perceived discrimination, community problems, depressive symptoms, hostility, poor self-regulation, risk-taking propensity, binge drinking, and marijuana use. For women, the index (range = 0–8; $M = 3.3$, $SD = 1.68$) comprised community problems, negative family relationships, affiliation with risk-taking peers, depressive symptoms, hostility, poor self-regulation, risk-taking propensity, and marijuana use. The effects of number of risk factors on unprotected intercourse for men and women were assessed with binomial regression. Both the men's and women's risk factor indices significantly predicted unprotected intercourse (men: odds ratio [OR] = 1.4, 95% confidence interval [CI] 1.2, 1.5, $p < 0.0001$; women: OR = 1.2, 95% CI 1.1, 1.4, $p < 0.001$).

We examined hypothesized protective factors separately for men and women to determine if the factor (1) demonstrated a main effect on unprotected intercourse controlling for the risk factor index and (2) moderated the influence of the risk factor index on unprotected intercourse (Table 2). For men, each unit change in the positive condom attitudes scale was associated with a 7% decrease in the likelihood of unprotected intercourse ($p = 0.013$). Among women, sexual communication with a parent or mentor, positive condom attitudes, and planful goal orientation were associated with a low likelihood of unprotected intercourse controlling for the risk factor index. No significant protective factor \times risk factor index interactions emerged for men or women.

DISCUSSION

RDS yielded a sample of rural African American young adults, a difficult-to-reach subgroup at risk for STIs. Among those who were sexually active, the majority (62.6%) did not use condoms consistently, a finding that underscores the need for interventions to deter the spread of STIs, including HIV, in rural Southern communities. Consistent with an ecological perspective, risk processes in community, family, and peer environments contributed to risk behavior, as did intrapersonal processes. Men and women were equally likely to report unprotected intercourse during the past three months, and perceived relationship monogamy was not associated with unprotected intercourse. The risk processes that explain unprotected intercourse, however, varied by gender for six of the 12 predictors examined. Significant gender interactions emerged for leaving the parental home, perceived discrimination, negative parent-young adult relationships, high risk-taking tendencies, cigarette smoking, binge drinking, and affiliations with risk-taking peers.

Leaving the parental home predicted unprotected intercourse for men but not women. The reasons for this are unclear. Men who remain in the family home may be more conventional, or men who leave home at this age may experience an increase in community-based stress. Gender differences in the impact of perceived discrimination are consistent with past findings that men report more overt discrimination, particularly from police and the judicial system,⁵⁷ and that discrimination elicits different physiological effects for men and women.⁵⁸ These experiences may affect men's hope for the future, engagement in planful self-regulation, and interest in conventional paths to success, decreasing their concern about future consequences of risky behavior.

Findings suggest a tendency for proximal relationship factors in peer and family environments to influence young adult women more strongly than they influence men. This is consistent with previous research⁵⁹ and theory regarding gender role socialization, positing that women are more sensitive than men to relationship needs and requirements, both in general and in their sexual behavior.⁶⁰ The influence of peers' behavior and norms on adolescent women's sexual risk behavior is well documented and replicated in this study with African American young adult women. The negative influence of poor family relationships on women's risk behavior is also well documented. Negative family relationships may undermine women's sexually protective behavior through several mechanisms. According to attachment theory, supportive family relationships

Table 2. Analysis of processes protecting rural African American young adults living in central Georgia (n=292) from engaging in unprotected intercourse: direct effects and moderating effects on risk: February 2007 to February 2008

Protective factors	Men				Women			
	Protective factor main effect		RFI × protective factor		Protective factor main effect		RFI × protective factor	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (CI)	P-value
Parent-young adult sexual communication	1.00 (0.95, 1.07)	0.834	1.00 (0.96, 1.04)	0.853	0.91 (0.87, 0.96)	<0.0001	0.98 (0.95, 1.01)	0.190
Informal mentor sexual communication	0.97 (0.90, 1.04)	0.360	0.99 (0.95, 1.05)	0.994	0.93 (0.89, 0.97)	<0.0001	1.00 (0.98, 1.02)	0.856
Planful goal orientation	1.04 (0.96, 1.13)	0.346	1.03 (0.99, 1.07)	0.156	0.90 (0.86, 0.95)	<0.0001	1.02 (0.99, 1.05)	0.185
Positive condom attitude	0.93 (0.87, 0.98)	0.013	1.01 (0.98, 1.04)	0.617	0.94 (0.89, 0.99)	0.012	1.01 (0.98, 1.04)	0.752

RFI = risk factor index

OR = odds ratio

CI = confidence interval

enhance self-regulatory processes and deter the use of risk behavior as a coping mechanism. Compromised family relationships also tend to increase the influence of risk-taking peers.⁶¹ In contrast, negative family relationships and risk-taking peers had little or no influence on men's behavior.

The association of risk-taking propensity with unprotected intercourse was stronger for men than for women. This finding is consistent with past studies indicating that hedonism and sensation seeking play a stronger role in men's than in women's sexual behavior and men's greater involvement in general risk-taking.^{62,63} For men and women, poor self-regulation emerged as a risk correlate. Poor self-regulation may compromise young adults' ability to engage in the planful behavior required to have condoms available and to use them. Poor self-regulation at this age may also encourage involvement with risk-taking peers, thereby increasing opportunities for unprotected intercourse.⁶⁴

Negative emotions also influenced both men and women. We expected stressors to compromise positive emotionality, and dispirited or angry young adults to be less likely to consider the importance of protective sexual behavior. We are not aware of previous studies that examine the unique influence of hostility, although Ethier et al. found that emotional distress, including hostility, was linked to sexual activity with multiple partners.⁶⁵ In African American samples, hostility is a consequence of contextual stressors and an antecedent of compromised health behavior.⁶⁶ Our findings suggest that it also plays a central role in undermining protective sexual behavior. Hostility may arise in

response to contextual strain that distracts young adults from using condoms. To support health-promoting interventions, it will be necessary to understand further how hostility contributes to sexual risk and associated decision-making.

Analyses of protective factors supported the importance of positive attitudes toward condoms in deterring unprotected intercourse for both men and women. The other findings supported the distinctiveness of the correlates of men's and women's unprotected intercourse. Among women, the direct influence, controlling for the risk factor index, of sexual communication from parents and mentors on avoidance of unprotected intercourse was consistent with studies of adolescents,⁶⁷ as was the finding that these interpersonal relationship variables exerted more influence on women's than on men's behavior. Also consistent with previous research on adolescents, women who were more oriented to future goals were less likely to engage in unprotected intercourse.⁶⁸

Limitations

The study's cross-sectional design precluded precise characterization of the temporal sequence between unprotected intercourse and the risk and protective variables. The criterion variable of unprotected intercourse during the past three months may have been influenced by participants' recall. Objective assessments of community characteristics through census data or independent ratings may be preferable to participants' reports for evaluating community problems. Studies are needed that examine concurrent substance use and sexual activity to provide a clearer indication of the

influence of substances on decision-making. Pregnancy intention is also an important factor that may clarify risk processes among African American young adults.⁶⁹ Sexual relationship power has been identified as an important predictor of safer sexual behavior among women. Finally, it remains unclear if the use of RDS to recruit participants can result in clustering effects that would bias the estimation of standard errors in multivariate models.

CONCLUSIONS

The prevalence of inconsistent condom use in this sample underscores the need for outreach to encourage safer sexual behavior. This is likely to be challenging. Few rural African American young adults pursue higher education, their employment is inconsistent, and their jobs rarely address employees' health needs. The influence of hostility on high risk-taking behavior suggests a need for creative engagement strategies to reach those most in need. The findings suggest that STI/HIV prevention for rural African American young adults must focus on the unique risk and protective factors associated with unprotected intercourse for men and women. Interventions for women should emphasize interpersonal relationships, whereas interventions for men should target dealing with discrimination. Hostility is an important target for both men and women, and may suggest a need to examine the influence of psychosocial stressors, including racial discrimination and the challenges of living in a resource-poor rural community. Attitudes about condoms must be a clear intervention focus. Inclusion of parents and informal mentors may enhance prevention efforts among women.

REFERENCES

1. Miller WC, Ford CA, Morris M, Hancock MS, Schmitz JL, Hobbs MM, et al. Prevalence of chlamydial and gonococcal infections among young adults in the United States. *JAMA* 2004;291:2229-36.
2. Racial/ethnic disparities in diagnoses of HIV/AIDS: 33 states, 2001–2005. *MMWR Morb Mortal Wkly Rep* 2007;56(9):189-93.
3. Morris M, Hancock MS, Miller WC, Ford CA, Schmitz JL, Hobbs MM, et al. Prevalence of HIV infection among young adults in the United States: results from the Add Health Study. *Am J Public Health* 2006;96:1091-7.
4. Warner L, Newman DR, Austin HD, Kamb ML, Douglas JM Jr, Malotte CK, et al. Condom effectiveness for reducing transmission of gonorrhea and chlamydia: the importance of assessing partner infection status. *Am J Epidemiol* 2004;159:242-51.
5. Arnett JJ. Emerging adulthood: a theory of development from the late teens through the twenties. *Am Psychol* 2000;55:469-80.
6. Aseltine RH Jr, Gore S. Work, postsecondary education, and psychosocial functioning following the transition from high school. *J Adolesc Res* 2005;20:615-39.
7. French K, Finkbiner R, Duhamel L. Patterns of substance use among minority youth and adults in the United States: an overview and synthesis of national survey findings. Fairfax (VA): Department of Health and Human Services (US); 2002.
8. Chesney MA, Koblin BA, Barresi PJ, Husnik MJ, Celum CL, Colfax G, et al. An individually tailored intervention for HIV prevention: baseline data from the EXPLORE study. *Am J Public Health* 2003;93:933-8.
9. DiClemente RJ, Wingood GM. A randomized controlled trial of an HIV sexual risk-reduction intervention for young African-American women. *JAMA* 1995;274:1271-6.
10. DiClemente RJ, Wingood GM, Harrington KF, Lang DL, Davies SL, Hook EW 3rd, et al. Efficacy of an HIV prevention intervention for African American adolescent girls: a randomized controlled trial. *JAMA* 2004;292:171-9.
11. Jemmott JB 3rd, Jemmott LS, Braverman PK, Fong GT. HIV/STD risk reduction interventions for African American and Latino adolescent girls at an adolescent medicine clinic: a randomized controlled trial. *Arch Pediatr Adolesc Med* 2005;159:440-9.
12. Rosser BR, Bockting WO, Rugg DL, Robinson BB, Ross MW, Bauer GR, et al. A randomized controlled intervention trial of a sexual health approach to long-term HIV risk reduction for men who have sex with men: effects of the intervention on unsafe sexual behavior. *AIDS Educ Prev* 2002;14(3 Suppl A):59-71.
13. St. Lawrence JS, Crosby RA, Belcher L, Yazdani N, Brasfield TL. Sexual risk reduction and anger management interventions for incarcerated male adolescents: a randomized controlled trial of two interventions. *J Sex Educ Ther* 1999;24:9-17.
14. Stanton BF, Li X, Ricardo I, Galbraith J, Feigelman S, Kaljee L. A randomized, controlled effectiveness trial of an AIDS prevention program for low-income African-American youths. *Arch Pediatr Adolesc Med* 1996;150:363-72.
15. Farrell AD, Danish SJ, Howard CW. Relationship between drug use and other problem behaviors in urban adolescents. *J Consult Clin Psychol* 1992;60:705-12.
16. Norris AE, Ford K. Moderating influence of peer norms on gender differences in condom use. *Appl Dev Sci* 1998;2:174-81.
17. Raffaelli M, Crockett LJ. Sexual risk taking in adolescence: the role of self-regulation and attraction to risk. *Dev Psychol* 2003;39:1036-46.
18. Cook BJ, Córdova DI. Minorities in higher education: 22nd annual status report. Washington: American Council on Education; 2008.
19. Brody GH, Chen YF, Murry VM, Ge X, Simons RL, Gibbons FX, et al. Perceived discrimination and the adjustment of African American youths: a five-year longitudinal analysis with contextual moderation effects. *Child Dev* 2006;77:1170-89.
20. Adimora AA, Schoenbach VJ, Martinson FE, Donaldson KH, Fulilove RE, Aral SO. Social context of sexual relationships among rural African Americans. *Sex Transm Dis* 2001;28:69-76.
21. Auvert B, Buvé A, Ferry B, Caraël M, Morison L, Lagarde E, et al. Ecological and individual level analysis of risk factors for HIV infection in four urban populations in sub-Saharan Africa with different levels of HIV infection. *AIDS* 2001;15 Suppl 4:S15-30.
22. Cubbin C, Hadden WC, Winkleby MA. Neighborhood context and cardiovascular disease risk factors: the contribution of material deprivation. *Ethn Dis* 2001;11:687-700.
23. Aronowitz T. The role of "envisioning the future" in the development of resilience among at-risk youth. *Public Health Nurs* 2005;22:200-8.
24. Dupéré V, Lacourse E, Willms JD, Leventhal T, Tremblay RE. Neighborhood poverty and early transition to sexual activity in young adolescents: a developmental ecological approach. *Child Dev* 2008;79:1463-76.
25. Ramirez-Valles J, Zimmerman MA, Juarez L. Gender differences of neighborhood and social control processes: a study of the timing of first intercourse among low-achieving, urban, African American youth. *Youth Soc* 2002;33:418-41.
26. Gibbons FX, Gerrard M, Cleveland MJ, Wills TA, Brody G. Perceived discrimination and substance use in African American parents and their children: a panel study. *J Pers Soc Psychol* 2004;86:517-29.
27. DiClemente RJ, Crosby RA. Sexually transmitted diseases among adolescents: risk factors, antecedents, and prevention strategies. In: Adams GR, Berzonsky MD, editors. *The Blackwell handbook of adolescence*. Oxford (UK): Blackwell; 2003. p. 573-605.
28. Kogan SM, Brody GH, Gibbons FX, Chen Yf, Grange C, Simons R, et al. Mechanisms of family impact on African American adolescents' HIV-related behavior. *J Res Adolesc*. In press.
29. Wills TA, Gibbons FX, Gerrard M, Murry VM, Brody GH. Family communication and religiosity related to substance use and

- sexual behavior in early adolescence: a test for pathways through self-control and prototype perceptions. *Psychol Addict Behav* 2003;17:312-23.
30. Hutchinson MK, Jemmott JB 3rd, Jemmott LS, Braverman P, Fong GT. The role of mother-daughter sexual risk communication in reducing sexual risk behaviors among urban adolescent females: a prospective study. *J Adolesc Health* 2003;33:98-107.
 31. Capaldi DM, Stoolmiller M, Clark S, Owen LD. Heterosexual risk behaviors in at-risk young men from early adolescence to young adulthood: prevalence, prediction and association with STD contraction. *Dev Psychol* 2002;38:394-406.
 32. Rodgers KB. Parenting process related to sexual risk-taking behaviors of adolescent males and females. *J Marriage Fam* 1999;61:99-109.
 33. Pack RP, Crosby RA, St. Lawrence JS. Associations between adolescents' sexual risk behavior and scores on six psychometric scales: impulsivity predicts risk. *J HIV/AIDS Prev Educ Adolesc Child* 2001;4:33-47.
 34. Kowaleski-Jones L, Mott FL. Sex, contraception and childbearing among high-risk youth: do different factors influence males and females? *Fam Plann Perspect* 1998;30:163-9.
 35. Wingood GM, DiClemente RJ. The influence of psychosocial factors, alcohol, drug use on African-American women's high-risk sexual behavior. *Am J Prev Med* 1998;15:54-9.
 36. Crepaz N, Marks G. Are negative affective states associated with HIV sexual risk behaviors? A meta-analytic review. *Health Psychol* 2001;20:291-9.
 37. Bachanas PJ, Morris MK, Lewis-Gess JK, Sarett-Cuasay EJ, Flores AL, Sirl KS, et al. Psychological adjustment, substance use, HIV knowledge, and risky sexual behavior in at-risk minority females: developmental differences during adolescence. *J Pediatr Psychol* 2002;27:373-84.
 38. Tapert SF, Aarons GA, Sedlar GR, Brown SA. Adolescent substance use and sexual risk-taking behavior. *J Adolesc Health* 2001;28:181-9.
 39. Fortenberry JD. Adolescent substance use and sexually transmitted diseases risk: a review. *J Adolesc Health* 1995;16:304-8.
 40. Wechsler H, Dowdall GW, Maenner G, Gledhill-Hoyt J, Lee H. Changes in binge drinking and related problems among American college students between 1993 and 1997. *J Am Coll Health* 1998;47:57-68.
 41. DiClemente RJ, Wingood GM, Crosby RA, Cobb BK, Harrington K, Davies SL. Parent-adolescent communication and sexual risk behaviors among African American adolescent females. *J Pediatr* 2001;139:407-12.
 42. Rhodes JE, Ebert L, Fischer K. Natural mentors: an overlooked resource in the social networks of young, African American mothers. *Am J Community Psychol* 1992;20:445-61.
 43. Robbins RN, Bryan A. Relationships between future orientation, impulsive sensation seeking, and risk behavior among adjudicated adolescents. *J Adolesc Res* 2004;19:428-45.
 44. St. Lawrence JS. African-American adolescents' knowledge, health-related attitudes, sexual behavior, and contraceptive decisions: implications for the prevention of adolescent HIV infection. *J Consult Clin Psychol* 1993;61:104-12.
 45. Heckathorn DD. Respondent-driven sampling II: deriving valid population estimates from chain-referral samples of hidden populations. *Soc Problems* 2002;49:11-34.
 46. Heckathorn DD. Respondent-driven sampling: a new approach to the study of hidden populations. *Soc Problems* 1997;44:174-99.
 47. Forehand R, Brody GH, Armistead L, Dorsey S, Morse E, Morse PS, et al. The role of community risks and resources in the psychosocial adjustment of at-risk children: an examination across two community contexts and two informants. *Behav Ther* 2000;31:395-414.
 48. Wills TA, Blechman EA, McNamara G. Family support, coping, and competence. In: Hetherington EM, Blechman EA, editors. *Stress, coping, and resiliency in children and families*. Hillsdale (NJ): Erlbaum and Associates; 1996. p. 107-33.
 49. Kurdek LA. Conflict resolution styles in gay, lesbian, heterosexual nonparent, and heterosexual parent couples. *J Marriage Fam* 1994;56:705-22.
 50. Elliott DS, Ageton SS, Huizinga D. *Explaining delinquency and drug use*. Beverly Hills (CA): Sage Publications; 1985.
 51. Carey KB, Neal DJ, Collins SE. A psychometric analysis of the self-regulation questionnaire. *Addict Behav* 2004;29:253-60.
 52. Joe GW, Broome KM, Rowan-Szal GA, Simpson DD. Measuring patient attributes and engagement in treatment. *J Subst Abuse Treat* 2002;22:183-96.
 53. Radloff LS. The CES-D Scale: a self-report depression scale for research in the general population. *Appl Psychol Meas* 1977;1:385-401.
 54. Snyder CR, Sympson SC, Ybasco FC, Borders TF, Babyak MA, Higgins RL. Development and validation of the State Hope Scale. *J Pers Soc Psychol* 1996;70:321-35.
 55. Salganik MJ, Heckathorn DD. Sampling and estimation in hidden populations using respondent-driven sampling. *Sociol Methodol* 2004;34:193-239.
 56. Gardner W, Mulvey EP, Shaw EC. Regression analyses of counts and rates: poisson, overdispersed poisson, and negative binomial models. *Psychol Bull* 1995;118:392-404.
 57. Krieger N, Sidney S. Racial discrimination and blood pressure: the CARDIA study of young black and white adults. *Am J Public Health* 1996;86:1370-8.
 58. Morris-Prather CE, Harrell JP, Collins R, Leonard KL, Boss M, Lee JW. Gender differences in mood and cardiovascular responses to socially stressful stimuli. *Ethn Dis* 1996;6:123-31.
 59. Bowleg L. Love, sex, and masculinity in sociocultural context: HIV concerns and condom use among African American men in heterosexual relationships. *Men Masculinities* 2004;7:166-86.
 60. Lucke JC. Gender roles and sexual behavior among young women. *Sex Roles* 1998;39:273-97.
 61. Doljanac RF, Zimmerman MA. Psychosocial factors and high-risk sexual behavior: race differences among urban adolescents. *J Behav Med* 1998;21:451-67.
 62. Ball IL, Farnill D, Wangeman JF. Sex and age differences in sensation seeking: some national comparisons. *Br J Psychol* 1984;75:257-65.
 63. Byrnes JP, Miller DC, Schafer WD. Gender differences in risk taking: a meta-analysis. *Psychol Bull* 1999;125:367-83.
 64. Crockett LJ, Raffaelli M, Shen Y-L. Linking self-regulation and risk proneness to risky sexual behavior: pathways through peer pressure and early substance use. *J Res Adolesc* 2006;16:503-25.
 65. Ethier KA, Kershaw TS, Lewis JB, Milan S, Nicolai LM, Ickovics JR. Self-esteem, emotional distress and sexual behavior among adolescent females: inter-relationships and temporal effects. *J Adolesc Health* 2006;38:268-74.
 66. Grothe KB, Bodenlos JS, Whitehead D, Olivier J, Brantley PJ. The psychosocial vulnerability model of hostility as a predictor of coronary heart disease in low-income African Americans. *J Clin Psychol Med Settings* 2008;15:163-9.
 67. Perrino T, Gonzalez-Soldevilla A, Pantin H, Szapocznik J. The role of families in adolescent HIV prevention: a review. *Clin Child Fam Psychol Rev* 2000;3:81-96.
 68. Bolland JM. Hopelessness and risk behaviour among adolescents living in high-poverty inner-city neighbourhoods. *J Adolesc* 2003;26:145-58.
 69. Crosby RA, DiClemente RJ, Wingood GM, Rose E, Lang D. Correlates of unplanned and unwanted pregnancy among African-American female teens. *Am J Prev Med* 2003;25:255-8.