

Are Partner and Relationship Characteristics Associated With Condom Use in Zambian Nonmarital Relationships?

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CONTEXT: In Zambia, as in many other Sub-Saharan African countries, condom use is far below the level needed to alleviate serious threats to sexual and reproductive health. It is important to understand if and how partner and relationship characteristics are independently associated with condom use within nonmarital, noncohabiting relationships.

METHODS: Descriptive and logistic regression analyses of data on 657 nonmarital, noncohabiting relationships reported by male and female respondents in the 2000 Zambian Sexual Behavior Survey examined condom use in the 12 months preceding the survey.

RESULTS: Partner characteristics were not independently associated with condom use. Relationship characteristics that were significant largely differed by gender. Condom use within both male- and female-reported relationships was elevated if the male partner was five or more years older than the female (odds ratios, 2.1 and 3.7, respectively). Within male-reported relationships, having a partner from the same community was associated with a reduced likelihood of condom use (0.5); within female-reported relationships, the odds of condom use were elevated if sex had occurred only once (4.3).

CONCLUSIONS: Condom promotion programs and interventions in Africa must take into account the relationship characteristics of intended participants, paying special attention to gender differences.

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Social marketing and other condom promotion schemes have substantially increased condom availability in Africa, but condom use in many African countries remains below the level needed to alleviate threats to sexual and reproductive health. In response to this problem, some researchers have suggested looking at the ways in which the dynamics of sexual relationships influence condom use. According to these researchers, because condoms are used by couples, the preoccupation of most existing research with the effects of individual characteristics may have limited the development of effective strategies for motivating condom use.¹

The study described in this article used data from the 2000 Zambian Sexual Behavior Survey to examine if and how partner and relationship characteristics of people in nonmarital, noncohabiting relationships are associated with condom use. In addition, it examined the effects of respondents' characteristics on condom use and how those associations change when relationship and partner characteristics are taken into account.

The focus is on nonmarital sexual relationships for two reasons. First, such relationships often involve individuals whose youth or unsafe sexual behavior places them at high risk for unintended pregnancy or sexually transmitted infection (STI). Second, research is available on the associations of condom use with partner and relationship characteristics of married and cohabiting partners, but little is known about this issue in the context of nonmarital, noncohabiting sexual relationships.²

REPRODUCTIVE HEALTH IN ZAMBIA

Even within the African context, threats to Zambians' sexual and reproductive health are unusually widespread. With a national HIV prevalence rate of 20%, Zambia has one of the most severe AIDS epidemics in Africa.³ Also, Zambia's total fertility rate is among the continent's highest.⁴ To address these problems, Zambians have developed a solid epidemiological surveillance and research system for STIs; instituted programs for promoting safer sexual behavior, blood screening and STI control; and implemented social marketing schemes for the distribution of condoms. In addition, a national family planning program has been working to reduce fertility since the 1970s.⁵

These efforts have yielded some success: Knowledge of HIV/AIDS is nearly universal; sexual networking involving multiple partners and levels of premarital sexual activity have declined among men; and the sales, distribution and use of condoms have increased.⁶ Furthermore, between the 1980s and 1990s, the total fertility rate declined from 6.5 to 6.1, and use of modern family planning methods more than doubled.⁷ However, problematic areas remain: Condom use is still far below the level needed to make a significant dent in the HIV epidemic, and between 1996 and 1998, condom use declined in nonregular relationships.⁸

One important criticism made of the Zambian health program is that it has not effectively served women. For instance, one study reported that between 1996 and 1998, no changes occurred in sexual behavior among women at

a time of discernible increases in safer-sex practices among men.⁹ Another study, using data from the 1996 Lusaka Sexual Behavior and Condom Use Survey, showed that condom promotion campaigns have been successful at directly serving men but have left women dependent on their male partners for access; the author attributed men's advantaged position in health initiatives to traditional cultural and socioeconomic advantages that enable them to effectively protect their interests.¹⁰

It is clear that understanding the factors regulating condom use in Zambia is critical to the success of the country's health programs. Observed differences between women's and men's experiences suggest that these factors be examined separately for each sex, and that particular attention be paid to identifying the factors limiting women's use of condoms.

LITERATURE REVIEW

The most common approach to understanding the effects of relationship characteristics on condom use employs ideas from the health belief model. The model views condoms as a means of preventing STIs and condom use as being dependent on perceptions of risk or susceptibility.¹¹ In the case of HIV/AIDS, the long incubation period during which a person can infect others without showing any visible symptoms means that risk can be judged only from knowledge of a person's sexual history and background. The health belief model thus suggests that faced with the threat of HIV/AIDS, most people will use lack of knowledge as an indicator of risk and use condoms in relationships with partners whose backgrounds are unknown to them.¹² The health belief model's predictive power is likely reinforced by the peculiar dynamics influencing condom use. In many parts of the world, the stigma attached to the condom (because of its association with infidelity, promiscuity, emotional detachment and lack of commitment) makes it difficult for people to broach condom use with partners and possibly ensures that the method is used only with partners about whom little is known.¹³

Empirical evidence from the United States provides substantial support for the health belief model. Many researchers have found that condom use is less common among people in steady and romantic relationships than among people in casual and nonromantic relationships.¹⁴ These researchers argue that steady and romantic relationships are associated with reduced condom use because they are characterized by transparency in personal histories. Also, studies using relationship duration as a marker for relationship stability and transparency have found it to be inversely related to condom use.¹⁵ Additionally, social and demographic dissimilarities between partners—good proxies for lack of background transparency—are associated with condom use in a manner consistent with the health belief model: In one study, adolescent couples composed of partners from different racial or ethnic groups, age-groups or neighborhoods were more likely than others to use condoms.¹⁶

Yet, not all U.S. studies have found results consistent with the health belief model. In some, casual partners were less likely to use condoms than couples in steady relationships, and couples with partners from different schools, grades and age-groups were less likely than other couples to use condoms.¹⁷ These results suggest that some aspects of condom use decisions have been overlooked by the health belief model. For instance, differences in power and expectations between partners with dissimilar social and demographic backgrounds may limit rather than motivate condom use.¹⁸ In addition, partners in steady relationships, who have higher coital frequency than those in casual relationships, may be more likely to use condoms to prevent pregnancy.¹⁹

Although the U.S. research lacks consensus on the direction of relationship effects, it clearly indicates that the characteristics of both partners and aspects of their relationship are key to understanding the circumstances in which condoms are used. One study of unmarried U.S. men found that their attitudes and characteristics were important predictors of contraceptive use and of efforts to avoid STIs, even after female partners' characteristics were controlled for.²⁰ Another study found that the characteristics of teenage women, their partners and their relationships played independent roles in predicting nonmarital teenage pregnancy and its outcome.²¹

Research on the role of relationship characteristics in condom use among Africans has been very limited, but it too finds varying support for the health belief model. For instance, one study's finding that respondents in several African countries reported trust of a partner as a primary reason for not using condoms in nonmarital relations is consistent with the model.²² By contrast, two studies found no differences in condom use between partners involved in casual sex and those in steady relationships.²³ And in another study, age disparity between partners had positive effects on HIV infection rates among rural Zimbabwean adolescents, suggesting that protective behavior did not increase among couples who differed significantly in age.²⁴

Considerably more research is needed within African settings to clarify how consistent behavior is with the belief model. Like the U.S. research, this work will have to utilize multiple direct measures of relationship dynamics and include both partner and respondent characteristics. Toward that end, this study examines the association of condom use with relationship type, relationship duration, and partner social and demographic dissimilarity, using data on unmarried and noncohabiting partners in Zambia. The study includes partner variables and a large number of respondent characteristics as predictors and thus yields a more comprehensive explanation of condom use in nonmarital settings than is available from existing African research.

METHODS

Data

Data for these analyses were from the 2000 Zambian Sexual Behavior Survey, developed by the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the MEASURE Eval-

TABLE 1. Variables derived from the 2000 Zambian Sexual Behavior Survey to assess characteristics associated with condom use in nonmarital, noncohabiting relationships

Variable	Survey question	Measurement
Dependent variable		
Condom use at last sex	The last time you had sex, did you or did this partner use a condom?	1=yes; 0=no
Respondent characteristics		
Months since first sex with partner	When did you first have sex with this partner?	Natural logarithm of months since first sex
Secondary schooling	What is the highest level of schooling you have attended?	1=secondary, higher; 0=primary, no school
Urban residence	Residence?	1=urban; 0=rural
Age in completed years	How old were you at your last birthday?	Years
Length of continuous time in community	How long have you been living continuously in [name of village/town/city]?	Years
Age at first sex	At what age did you first have sex?	Completed age in years
Had other partners in last 12 months	In the last 12 months, with how many people overall have you had sex (including these last partners we've discussed)?	1=more than one partner; 0=one partner
Thinks partner has other partners	Do you think [this partner] has other partners?	1=yes; 0=no, don't know
Knows condoms protect against AIDS	(1) In what ways can people reduce their chances of getting infected with HIV? Any other ways? (2) Can people reduce their chances of getting the AIDS virus by using a condom correctly every time they have sex?	1=answered condom use to question 1 or yes to question 2; 0=all others
Knows of AIDS media programs	(1) Have you seen a show on ZNBC television called "XPlosion?" (2) Have you heard of "Africa Alive?"	1=answered yes to either question, 0=all others
Thinks unmarried women should always be able to buy condoms	Do you think unmarried women should always be able to buy condoms?	1=yes; 0=no, don't know
Partner characteristics		
Urban residence	Where does this partner live?	1=for urban respondents, partners who lived in the same household, village or neighborhood; and for other respondents, partners who lived in another urban area; 0=all others
Age	How old is this partner?	1=older than median partner age; 0=all others
Age unknown	How old is this partner?	1=not known; 0=all others
Relationship characteristics		
Casual sexual relationship	What is your relationship with this partner?	1=someone whom you paid or who paid you for sex, casual acquaintance, other; 0=girlfriend/boyfriend not living with you
Partners from same household/village/neighborhood	Where does this partner live?	1=same household, same village or neighborhood; 0=other urban area, other rural area, other (specify), don't know
Man ≥5 years older than woman	(1) How old were you at your last birthday? (2) How old is [this partner]?	Age difference between partners
Onetime sexual contact	(1) When did you first have sex with this partner? (2) When did you last have sex with this partner?	1=was onetime sexual contact; 0=all others

uation project. The survey collected information about sexual history and behavior, knowledge of HIV/AIDS, and level of exposure to interventions among a nationally representative sample of women and men; it was conducted by the Zambian Central Statistical Office, with technical and financial assistance provided by the MEASURE Evaluation Project and the U.S. Agency for International Development.²⁵

The survey collected information on a maximum of three sexual encounters in the previous 12 months, so the study focused on condom use during those encounters only. The unit of analysis was transformed from respondent to sexual relationship, and relationships involving married or cohabiting partners were excluded. In all, 2,457 sexually active respondents reported 2,785 sexual relationships. After

excluding relationships involving married or cohabiting partners, the final sample consisted of 657 nonmarital, non-cohabiting relationships—437 reported by males and 220 reported by females. Thirty-three percent of eligible male respondents and 8% of eligible women contributed multiple relationships to the sample.

Survey data, such as those used here, have the advantage of providing a large number of variables to support complex multivariate analyses. In addition, assessments of the quality of survey data on health attitudes and behavior have concluded that they provide valid measurements of actual behavior.²⁶ A comparison of the 1996 and 1998 Zambian Demographic and Health Surveys, which are similar to the survey used in this study, concluded that the data were reliable after showing that they were highly consistent on many indicators of sexual behavior.²⁷

Measures

This study examined the hypotheses that condom use is most likely to occur during casual sex, is elevated for socioeconomically and demographically dissimilar partners, and decreases as a relationship evolves. The variables used to assess these hypotheses are described in detail in Table 1.

- **Dependent variable.** The dependent variable—condom use at last sex—was measured by one question: “The last time you had sex, did you or did this partner use a condom?” Respondents were asked to report on up to three relationships in the last year.

- **Respondent characteristics.** The analyses controlled for a number of respondent characteristics, selected using insights from the health belief and fertility models. In addition to risk perception, the health belief model assumes that condom use is dependent on knowledge of the severity of a disease, awareness of the condom’s effectiveness, self-efficacy and social support.²⁸ The fertility model views the condom as a means of pregnancy avoidance, whose use depends on one’s economic opportunities and on perceptions of the costs and benefits of pregnancy.²⁹

The number of months since first sex was used as a measure of trends in condom use over time. As condom promotion and HIV/AIDS programs have proliferated in most African countries over time, it is reasonable to expect that the more recently a relationship began, the more exposure to promotion programs the partners had had and, therefore, the more likely they were to have used condoms. A few respondents with very large values made this variable highly skewed. Thus, to prevent observations with extreme values from unduly influencing the results, I applied a logarithmic transformation to it before entering it in the multivariable analyses.

Education was measured as a binary variable indicating whether a respondent had had less than or at least some secondary schooling. The fertility model suggests that greater education should lead to greater condom use, because education increases the costs of pregnancy and reduces its benefits by providing better access to employment and life options that compete with childbearing. Also, ed-

ucation increases wealth and thereby reduces access and cost impediments to acquiring condoms.

Other respondent variables measuring aspects of the fertility model were urban residence, age, length of continuous residence in a community and age at first sex. Urban residence is associated with increased costs of pregnancy, so urban residents should be more likely than others to use condoms. Age should be negatively related to condom use because older people are better able to manage a pregnancy and have fewer incentives than younger people to avoid one. The length of continuous residence in a community was included because long-time residents in a community are likely to have access to local sources of social support and resources that make it easier to have and rear children; those respondents are less likely than others to use condoms because their costs of childbearing are decreased. Respondents who were young at first sex are assumed to be more pronatalist and also to have few resources for negotiating sexual activity. Thus, respondents who were younger at first sex should be less likely to use condoms.

A respondent’s number of partners in the year before the survey was included as a health belief variable reflecting perceptions of infection risk. A binary measure indicated whether a respondent had had more than one partner in the previous year. The health belief model suggests that having multiple partners could increase condom use if those who engage in high-risk activities (such as using professional sex workers) do so because they are protected by condoms. However, according to the health belief model, condom use could be reduced among such respondents if involvement in multiple relationships reflects ignorance or lack of appreciation of the AIDS threat.

Belief that a partner has other partners was used as an additional binary measure of HIV and AIDS risk perception. According to the health belief model, condom use should be elevated among those who believed their partners to be involved with other persons because those who perceive risk should be more likely than others to protect themselves.

A respondent’s belief in the prophylactic value of condoms was measured with a binary variable indicating knowledge that condoms can prevent HIV infection. The measure comes from two survey questions. In the first one, respondents had to identify ways of avoiding HIV infection. The second question was asked only of respondents who failed to mention condom use as an answer to the first question; it assessed knowledge that proper use of condoms provides protection against HIV infection. Use of condoms should be higher among respondents who believed in their prophylactic value.

As most health initiatives rely heavily on the mass media to promote information about risky behaviors and condoms, knowledge of AIDS mass media initiatives was included as another health belief variable to measure respondents’ awareness of condoms’ effectiveness. This was a dummy measure based on two survey questions that asked whether respondents had seen *X-plosion* or heard of *Africa Alive!*,

TABLE 2. Selected characteristics of reported nonmarital, noncohabiting relationships, by respondent's gender

Characteristic	Male (N=437)	Female (N=220)
Condom use		
% who used condom at last sex	36.6	33.2
Respondent characteristics		
Mean time since first sex with partner (mos.)	15.1**	22.8
% with some secondary schooling	48.9*	39.1
% urban	19.9**	40.5
Mean age (yrs.)	25.9*	24.3
Mean continuous residence in community (yrs.)	11.3	11.3
Mean age at first sex (yrs.)	15.6	16.1
% who had other partners in last 12 months	64.3**	22.7
% who think their partner has other partners	31.1**	44.4
% who know condoms protect against AIDS	82.8	83.6
% who know of AIDS media programs	22.4	22.3
% who think unmarried women should always be able to buy condoms	71.2	72.3
Partner characteristics		
% urban	29.1**	44.6
% whose age is unknown	18.5*	23.2
% younger than median partner age	62.1**	21.0
% older than median partner age	19.3**	55.9
Relationship characteristics		
% casual sexual relationship	12.9	10.9
% with partner from same household/village/neighborhood	63.2**	49.6
% with man ≥5 yrs. older than woman	39.8	32.3
% onetime sexual contact	20.0	20.5

*Significantly different by gender at p<.05. ** Significantly different by gender at p<.01.

two multinational, multimedia initiatives that use entertainment and education to spread the AIDS prevention message to youth.³⁰ According to the health belief model, condom use should be higher among those with some knowledge of AIDS prevention programs than among other respondents.

The question “Do you think unmarried women should always be able to buy condoms?” was used as a measure of a respondent’s sex role attitudes. In general, people with liberal attitudes toward women’s sexuality are more supportive of condom use than those with conservative attitudes.³¹ The health belief literature also suggests that self-efficacy—one’s willingness to confront economic, social and psychological barriers in everyday living—is important to condom acquisition. It is reasonable to believe that in traditional African societies, people with liberal sex role attitudes might have greater self-efficacy than others and thus be more likely to use condoms.

• **Partner characteristics.** Ideally, partner variables should replicate respondent variables, because in theory, both are connected by the same mechanisms to condom use. Unfortunately, the data include only two distinct partner variables—urban residence and age—both of which measure perceptions of the costs of pregnancy. Partner’s urban residence should have the same association with condom use for partners as for respondents and for the same reasons.

Hypothesizing the effect of partner’s age is complicated because a large proportion (20%) of respondents did not

know their partner’s age. To solve that problem, the partner’s age variable was transformed into a three-level categorical variable, including “don’t know partner’s age” as one category. The other two categories distinguished respondents whose partners were older than the median partner age for that sex (18 for men and 25 for women) from others. Partner’s age should be negatively related to condom use, as it measures the costs of pregnancy. Compared with younger partners, older partners should be more comfortable with a pregnancy and have fewer incentives to avoid one.

Obviously, the “don’t know partner’s age” variable is not really an age effect. Assuming that couples who are familiar with each other’s backgrounds are more likely than other couples to know each other’s ages, it is best seen as another measure of couple familiarity. Therefore, if the health belief model’s claim that lack of transparency in partner personal histories encourages condom use is true, then respondents who did not know the age of their partner should report more condom use than other respondents.

• **Relationship characteristics.** The study included four relationship measures. First was a variable that distinguishes respondents involved in casual and noncommitted sexual activity—including encounters with commercial sex workers, casual acquaintances and others—from those involved with boyfriends or girlfriends. The health belief model suggests that condom use should be higher in casual relationships than in steady ones.

Two relationship variables measured social and demographic dissimilarity between partners. One was a binary measure indicating whether partners resided in the same household, village or neighborhood; couples in which the two partners resided in the same household, village or neighborhood were expected to use condoms at lower rates than other couples. The second was a binary measure indicating that the man was at least five years older than the female partner. Condom use should be higher in relationships in which the man was at least five years older than the woman.

Finally, to assess whether condom use declines as a relationship evolves, a binary measure was used to compare condom use in onetime sexual encounters with use in sexual acts within ongoing relationships. The survey question on the timing of the most recent sexual act had a response category “was a onetime sexual contact.” Onetime encounters were defined as any for which either that response was checked or the reported length of time since first sexual encounter coincided with the length of time since the most recent encounter. Reports of the time since sexual encounter have a potential for error. Still, this measure distinguishes relationships that had been going on for some time from short-term relationships or onetime sexual encounters. If the health belief model is correct that condom use declines over the course of a relationship as couples become familiar with each other, then levels of use should be higher in onetime sexual encounters than in those that take place within enduring relationships.

TABLE 3. Percentage of nonmarital, noncohabiting relationships (N=657) in which a condom was used at last sex, by selected characteristics, according to respondent's gender

Characteristic	Male	Female	Characteristic	Male	Female
RESPONDENT			Yrs. of continuous time in community		
Mos. since first sex with partner			<3	43.4	50.0*
<3	42.1	46.1	3-8	31.3	29.0
3-10	35.2	39.0	9-18	33.3	27.1
11-24	33.1	34.0	≥19	34.4	24.0
≥25	36.0	24.0	Age at first sex		
Had other partners in last year			<14	32.8	22.4
No	42.9*	36.5	14-15	40.0	31.1
Yes	33.1	22.0	16-17	46.6	32.7
Thinks partner has other partners			≥18	37.9	46.2
No	36.9	35.7	PARTNER		
Yes	36.0	29.9	Urban residence		
Knows condoms protect against AIDS			No	30.3**	27.0*
No	21.3**	25.0	Yes	52.0	40.8
Yes	39.8	35.8	Age unknown		
Knows of AIDS media programs			No	38.1	33.1
No	29.4**	28.7**	Yes	33.3	33.3
Yes	61.2	49.0	Age		
Thinks unmarried women should always be able to buy condoms			<median	36.1	37.4
No	30.2	23.0*	≥median	39.7	27.0
Yes	39.2	37.1	RELATIONSHIP		
Urban residence			Casual sexual relationship		
No	33.1**	29.0	No	36.7	33.0
Yes	50.6	39.3	Yes	35.7	37.5
Age			Partners live in same household/village/neighborhood		
<19	28.0	43.3**	No	46.6**	36.0
19-22	38.3	38.0	Yes	30.7	30.3
23-28	42.5	37.0	Man ≥5 yrs. older than woman		
≥29	35.1	10.2	No	31.7**	29.5
Education			Yes	44.2	40.8
<secondary	24.7**	26.9**	Onetime sexual contact		
≥secondary	49.1	43.0	No	35.1	26.9**
			Yes	42.5	57.8

*p<.05. **p<.01.

Analytic Techniques

Descriptive analysis was used to explore the characteristics of reported relationships, and bivariable analyses provided preliminary information about the associations between those characteristics and condom use. Binary logistic regression was used to examine observed associations within a multivariable framework. Three models were calculated: The first included only respondent characteristics, the second added partner characteristics and the third added relationship characteristics. The unknown parameters in the regressions were estimated with maximum likelihood procedures. The analyses did not adjust standard errors for clustering of observations by respondent because the majority of respondents did not have multiple partners.

RESULTS

Descriptive Analysis

About a third of both male- and female-reported relationships (37% and 33%, respectively) included condom use during the last sexual encounter (Table 2). Both involved respondents who were young (mean age, 25.9 and 24.3, re-

spectively) and had lived in their community for a relatively long time (11 years for each). The mean ages at first sex were 15.6 and 16.1 for male- and female-reported relationships, respectively. Most relationships (83-84%) involved respondents who knew that condoms protect against AIDS, but only 22% involved respondents who were aware of the media programs that are an important part of the Zambian government's information, education and communication response to the HIV epidemic. In the majority (71-72%) of relationships, respondents believed that unmarried women should always be able to purchase condoms.

Despite the similarities, there were also differences by gender, revealing that the sexes participate in substantially different sexual networks. In a significantly greater proportion of relationships reported by males than of relationships reported by females, respondents had had multiple partners in the last year (64% vs. 23%) and had had partners who were younger than the median partner age (62% vs. 21%) or who were from the same household, village or neighborhood (63% vs. 50%). On the other hand, the average number of months since first sex with their partner was larg-

TABLE 4. Odds ratios from multivariable logistic regression analyses of the likelihood that condoms were used within non-marital, noncohabiting partnerships, by model and respondent's gender

Characteristic	Male			Female		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Respondent						
Mos. since first sex with partner	0.87	0.84**	0.85	0.96	0.96	1.03
No. of sexual partners in last 12 months	0.56*	0.54*	0.52*	0.89	0.85	1.04
Thinks partner has other partners	1.25	1.26	1.25	1.08	1.04	0.79
Knows condoms protect against AIDS	2.10*	2.03*	2.15*	1.58	1.55	1.41
Knows of AIDS media programs	2.71**	2.52**	2.86**	2.31	2.47*	2.29
Thinks unmarried women should always be able to buy condoms	1.36	1.36	1.36	2.23*	2.34*	3.08*
Urban residence	1.21	0.78	0.95	1.14	0.87	1.01
Age	1.00	1.00	0.98	0.89**	0.90**	0.91**
Secondary schooling	2.16**	2.06**	1.83*	1.51	1.47	1.81
Yrs. of continuous residence in community	0.99	0.99	0.99	0.96	0.96	0.96*
Age at first sex	1.02	1.01	1.01	1.1***	1.19*	1.17**
Partner						
Urban residence	na	1.73	1.28	na	1.62	1.30
Age unknown	na	0.74	1.04	na	1.28	1.64
Older than median partner age	na	1.04	1.01	na	0.71	0.37
Relationship						
Casual sexual relationship	na	na	0.75	na	na	0.95
Partners live in same village/neighborhood	na	na	0.54*	na	na	0.89
Man \geq 5 yrs. older than woman	na	na	2.05*	na	na	3.73*
Onetime sexual contact	na	na	1.14	na	na	4.26**
Model Fit Statistics						
Max-rescaled R ²	18.90	19.89	23.19	26.89	28.25	37.81
-2 log likelihood	509.10	505.42	492.90	232.29	229.61	209.76
Change in likelihood (df)	na	3.68 (4)	12.52 (4)*	na	2.68 (4)	19.85 (4)**

*p<.05. **p<.01. Note: na=not applicable, because characteristic was not included in the model.

er in relationships reported by women than in those reported by men (22.8 vs. 15.1). Furthermore, in a greater proportion of relationships reported by women, respondents believed that their partners had had other partners (44% vs. 31%), did not know their partner's age (23% vs. 19%), had partners from urban areas (47% vs. 29%) or had partners who were older than the median partner age (56% vs. 19%).

The observed sex differences are consistent with the literature on sexual networking among young Africans. Young men's sexual networks often are driven by the search for pleasure and excitement, and act as venues for confirming and displaying masculinity.³² Thus, they tend to be unstable and involve many partners. In contrast, women's networks tend to be organized around more stable considerations, such as material need, security and the desire for early marriage and childbearing. For that reason, they tend to involve fewer partners. These differences likely shape the predictors of condom use among men and women.

Bivariable and Multivariable Analyses

The bivariable results show that several respondent variables were significantly associated with condom use; however, the findings differed by gender (Table 3, page 123). Among male-reported relationships, condom use was associated with not having had other partners in the last year; knowing that condoms protect against AIDS; knowing of AIDS media programs; living in an urban area; having at least some secondary education; having a partner who lives in an urban area; having a partner who does not live in the same household, village or neighborhood; and being five or more

years older than a partner. Among relationships reported by women, condom use was associated with knowing about AIDS media programs, believing that unmarried women should be able to buy condoms, being younger, having some secondary education, living a shorter continuous time in a community, having a partner who lives in an urban area and having had sex only once in the reported relationship.

In multivariable analyses including only respondent characteristics, several variables were significantly associated with condom use (Table 4). Within relationships reported by men, knowing that condoms protect against AIDS, knowing about AIDS mass media programs and having a secondary education were positively associated with condom use (odds ratios, 2.1–2.7); for each additional sexual partner in the last 12 months, the odds of condom use decreased (0.6). Among relationships reported by women, believing that unmarried women should always be able to buy condoms was associated with condom use (2.2). In addition, the odds of condom use increased with age at first sex (1.1) and decreased with age (0.9).

When partner variables were added to the model, none were associated with condom use in male- or female-reported relationships. However, two variables that were not significant in the first model became significant: For each month since first sex with a partner, the odds of condom use decreased within relationships reported by men (0.8), and relationships in which female respondents reported knowledge of AIDS media programs became more likely than others to include condom use (2.5). All other findings remained unchanged.

In the third model, which included relationship characteristics, the odds of condom use increased in both male- and female-reported relationships in which the male partner was five or more years older than the female (odds ratios, 2.1 and 3.7, respectively). In addition, male-reported relationships between partners from the same village or neighborhood were characterized by reduced odds of condom use (0.5); female-reported relationships in which only one sexual encounter occurred were characterized by elevated odds of use (4.3). Furthermore, number of months since first sex with a partner became nonsignificant among relationships reported by men, and length of time living in a community became associated with reduced condom use in relationships reported by women (0.96 per year). For both sexes, the -2 log likelihood decreased, indicating that the relationship characteristics contribute independently to explaining variance in condom use.

DISCUSSION

The study described in this article addressed the underexamined topic of partner and relationship characteristics' effects on condom use by analyzing data on Zambian nonmarital, noncohabiting relationships. It found no evidence that partner variables contribute independently to explaining condom use. Perhaps if we had been able to include more partner variables in the analyses, we would have found some significant effects.

However, the results showed that certain relationship characteristics are significantly associated with condom use. Although they differ by gender, all are consistent with the predictions of the health belief model. For both men and women, the significance and magnitude of the odds ratio for the effect of relationships in which the male partner is five or more years older than the female suggest that condom use increased as partners' ages diverged and their social and demographic characteristics became more dissimilar. Men with partners from the same community had a reduced likelihood of condom use, presumably because they were more aware of their partners' backgrounds and less worried about STIs. For women, condom use was more likely during the first sexual encounter with a partner than among subsequent ones. In other words, condom use declines over the course of a relationship as partners become more familiar with each other. The lack of an association between relationship type and condom use is consistent with studies from Zambia and other African countries that have found no differences in condom use between casual and steady partners.³³

The sex differentials in relationship effects are consistent with the differences between men's and women's sexual networks. For instance, residence in the same community was significant among young men, perhaps because most of their sexual relationships involve young women whose movements are restricted. In this context, nonmembership in a community may be an important marker of obscure background and thus trigger condom use. The variable was not significant for women, perhaps be-

cause their partners often are older men, who are geographically dispersed and mobile; in this situation, nonresidence in the same community is not a marker of obscurity.

The effect of onetime sexual contact was significant among women, possibly because their networks are regulated by relatively long-term and stable considerations. Condom use undermines the potential of relationships to evolve into long-term unions because it conveys stigma and can interfere with childbearing. In the women's networks, as a relationship endures, growing familiarity and trust are translated into reduced condom use. In contrast, this variable is not significant for men, as their relationships involve young women and have less pressure for reproduction and stability.

Respondent characteristics appear to be important predictors of condom use regardless of the inclusion of relationship variables. The results for respondent variables did not change greatly when the relationship characteristics were included in the model, and they remained consistent with results of earlier research incorporating only respondent variables. Research conducted in the United States has reached similar conclusions.³⁴

The findings for respondent characteristics provide considerable support to both the health belief and fertility models of condom use. One component of the health belief model—thinking that one's partner has other partners—was never significant, perhaps indicating that Zambian men and women have no illusions about the exclusivity of their relationships and that their suspicions of infidelity do not influence their perceptions of risk. Similarly, one component of the fertility model—respondent's urban residence—was never significant, presumably because the costs of bearing and rearing children do not vary much between urban and rural Zambia. However, the analyses show that health belief variables (i.e., number of sexual partners, knowledge of the protective effects of condoms and familiarity with AIDS media programs) were strongest for male-reported relationships, whereas fertility variables (i.e., age, years of continuous residence in a community and age at first sex) were strongest for female-reported relationships.

Limitations

The findings presented in this article show that relationship variables are significantly associated with condom use within nonmarital relationships, even when partner and respondent characteristics are controlled for. However, more precise, reliable and richer data collected from much larger samples will be needed to enable us to better understand the ways in which those variables affect condom use.

Program Implications

The results of this study have important implications for condom promotion programs. HIV/AIDS prevention efforts using information, education and communication programs and counseling services cannot rely solely on the characteristics of individuals to define vulnerable groups; they also have to

devote attention to relationship characteristics. Additionally, they need to target condom promotion efforts by gender.

For men, the results of this study suggest that traditional health initiatives have had some success in changing behavior. Knowledge about the prophylactic qualities of condoms or about AIDS media programs were positively associated with condom use within relationships reported by men. Condom promotion programs must continue to work toward educating and convincing men that condoms are effective in preventing HIV infection. In addition, programs need to persuade men to reduce multiple partner sexual networking or at least improve their protective behavior. Furthermore, programs should focus on relationships among same-aged partners and those from the same communities, as these unions are characterized by reduced condom use.

For women, the findings suggest that traditional health initiatives have not been as successful as they have been for men. Women who knew about the prophylactic qualities of condoms or about AIDS media programs were no more likely than other women to translate that knowledge into condom use. Thus, removing skepticism regarding the ability of condoms to protect against infection and increasing access to AIDS media programs will not substantially increase use among women. However, initiatives that promote liberal sex role attitudes regarding condom acquisition might work, as the findings suggest that women with such attitudes are more likely than others to report condom use. In addition, long-term relationships and those among age peers should be the focus of close attention in women's programs, as women in such relationships have reduced condom use and therefore are vulnerable to HIV.

As the literature indicates that men's health advantages arise from their traditional cultural and socioeconomic advantages,³⁵ efforts targeting women cannot be superficial or expect quick success. They must be sustained and long-term, and may require the involvement of men and communities. For instance, in Cameroon, to enhance women's confidence in buying and using condoms, advertising and promotion campaigns had to focus on generating social support among their parents.³⁶

It may be necessary for AIDS and condom promotion programs to coordinate with family planning programs to increase interest in fertility regulation, as women's desire for pregnancy poses major obstacles to condom use. Women who had lower fertility costs—for example, older women and those who had lived in their community for a long time—had reduced odds of using condoms. Unfortunately, increasing interest in fertility limitation will not be easy, as even fear of HIV has little impact on reproductive behavior in this setting.³⁷ However, increasing information on how HIV impacts children might help to increase interest in regulating fertility, as children's well-being is a compelling argument for family limitation in Zambia. For those women who know of the threat of AIDS and still want to have children, promoting willingness to evaluate personal risk of infection and encouraging testing may help them achieve their goals while reducing their risk of infection.³⁸

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RESUMEN

Contexto: En Zambia, al igual que en varios países del África Subsahariana, el uso del condón es mucho menor que el nivel deseado para aliviar las serias amenazas a la salud sexual y reproductiva de sus habitantes. Es importante saber si las características de la relación y de la pareja están independientemente relacionadas con el uso del condón en las relaciones fuera del matrimonio y con personas con las cuales no se cohabita.

Métodos: Se utilizaron análisis descriptivos y de regresión logística de los datos sobre el uso del condón durante los últimos 12 meses previos entre 657 relaciones de pareja notificadas por los encuestados (hombres y mujeres) en la Encuesta sobre Conducta Sexual realizada en Zambia en el año 2000. Los datos correspondían a relaciones sexuales no maritales con personas con quienes no se cohabitaban.

Resultados: Las características de la pareja no estuvieron independientemente relacionadas con el uso del condón. Las características de la relación que resultaron significativas fueron muy diferentes entre ambos sexos. El uso del condón indicado

tanto por los hombres como por las mujeres fue elevado si el hombre tenía mayor edad (de cinco o más años) que la mujer (razones de momios de 2,1 y 3,7, respectivamente). Dentro de la información suministrada por los hombres, el hecho de tener una pareja que residía en la misma comunidad se relacionó con una reducción de la probabilidad de uso del condón (0,5); con respecto a la información suministrada por las mujeres, las probabilidades de uso del condón aumentaron si la relación sexual había ocurrido solamente una vez (4,3).

Conclusiones: La promoción y las intervenciones relacionadas con el uso del condón en el África deben tomar en cuenta las características de las relaciones de los participantes, y se debe prestar especial atención a las diferencias que existen entre ambos sexos.

RÉSUMÉ

Contexte: En Zambie, comme dans beaucoup d'autres pays d'Afrique subsaharienne, l'usage du préservatif est largement inférieur au niveau nécessaire pour faire face aux graves menaces qui pèsent sur la santé sexuelle et reproductive. Il importe de comprendre si, et comment, les caractéristiques de partenaire et de relation sont indépendamment associées à l'usage du préservatif dans les relations non conjugales sans cohabitation.

Méthodes: Diverses analyses descriptives et de régression logistique des données relatives à 657 relations non conjugales sans cohabitation déclarées par les répondants masculins et féminins à l'enquête zambienne de 2000 sur le comportement sexuel examinent l'usage du préservatif durant les 12 mois précédant l'enquête.

Résultats: Les caractéristiques de partenaire n'ont pas révélé d'association indépendante avec l'usage du préservatif. Les caractéristiques de relation significatives se sont avérées largement différentes suivant le sexe. L'usage du préservatif dans les relations déclarées par les hommes comme par les femmes est apparu élevé si le partenaire masculin avait au moins cinq ans de plus que la femme (rapports de probabilités, 2,1 et 3,7, respectivement). Dans les relations déclarées par les hommes, l'appartenance de la partenaire à la même communauté s'est révélée associée à une moindre probabilité d'usage du préservatif (0,5); dans les relations déclarées par les femmes, cette probabilité est apparue supérieure si les rapports sexuels n'avaient eu lieu qu'une seule fois (4,3).

Conclusions: Les programmes et interventions de promotion du préservatif en Afrique doivent tenir compte des caractéristiques de relation des participants visés et faire tout particulièrement attention aux différences de nature sexospécifique.

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