Heterosexually Active Men's Beliefs About Methods For Preventing Sexually Transmitted Diseases

CONTEXT: *Most research on heterosexual transmission of HIV and other sexually transmitted diseases (STDs) has focused on women. However, heterosexual transmission of STDs cannot be prevented without a better understanding of men's, as well as women's, sexual beliefs and behaviors.*

METHODS: *Heterosexually active men's beliefs about four methods of STD prevention—abstinence, mutual monogamy, use of male condoms and use of female condoms—were elicited through open-ended interviews. A survey based on these responses was administered to a random sample of 486 heterosexually active men, and scores were calculated to examine their beliefs about each behavior. Additional analyses explored how these beliefs were related to men's characteristics and to their actual behavior.*

RESULTS: *The men held both positive and negative beliefs about the outcomes of using each method and thought that their partners, close friends, health care providers, family members and, to some extent, friends at church had opinions about whether they should use each method. Multiple regression analyses showed that the men's beliefs were related to their marital status and, to some extent, their race or ethnicity and education. Beliefs about the outcomes of practicing abstinence, practicing mutual monogamy and using male condoms with steady partners were significantly related to these behaviors; beliefs about whether they had support for practicing monogamy or using male condoms with steady partners were significant predictors of doing so.*

CONCLUSIONS: *Encouraging safer-sex practices among heterosexually active men will require addressing their beliefs and perceived norms about alternative methods of preventing STDs.*

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Heterosexual transmission accounted for the largest proportionate increase in the number of reported AIDS cases in the United States between 1996 and 2000,[1] and AIDS is the leading cause of death among individuals aged 25–44.[2] Other sexually transmitted diseases (STDs) also account for considerable morbidity and mortality.[3] Most of the research on heterosexual STD transmission has focused on women, undoubtedly because transmission from men to women is more efficient than the reverse,[4] women tend to have more severe sequelae than men and women traditionally have had less control of the means of prevention.[5] However, heterosexual STD transmission cannot be prevented without better understanding of men's, as well as women's, sexual beliefs and behaviors.[6]

Three strategies are recommended to reduce the risk of STD transmission: abstinence, mutual monogamy between uninfected partners and condom use. Heterosexual risk behaviors and male condom use have been well documented,[7] but information about other prevention strategies is scant. The purpose of this article is to provide information about heterosexually active men's beliefs about methods of STD prevention so that interventions can be better informed.

Beliefs about condoms are an important determinant of condom use.[8] As is true for women, men are more likely to use condoms with casual partners than with steady partners.[9] This may reflect the belief of some men that condoms are necessary only with nonmonogamous partners, to avoid "bringing anything home,"[10] or that introducing condoms into a steady relationship might imply infidelity.[11] Despite a relatively high general level of AIDS awareness, men who use condoms during vaginal intercourse do so primarily for contraception rather than disease prevention.[12]

Although research on men's beliefs about the female condom is limited, preliminary findings suggest that despite a lack of familiarity with the method, many men would be willing to try it.[13] However, some men are apprehensive about its efficacy, the embarrassment in asking a partner to use one, the potential reduction in sexual pleasure[14] and the concern that women could "sabotage" it if they desired a pregnancy but their male partner did not.[15] In addition, the female condom suffers from some of the same negative beliefs that men have about male condoms, including being associated with infidelity and disease.[16]

Heterosexually active men's beliefs about abstinence and monogamy have received scant research attention. Preliminary evidence suggests that in general, men are not in favor of abstinence,[17] and some believe that it is an "unnatural" and "unrealistic" strategy for STD prevention.[18] Very little information is available about their beliefs about monogamy as a disease prevention strategy.

The theory of reasoned action suggests that beliefs are important determinants of decisions about using such methods.[19] According to the theory, behavior (e.g., using a condom) is a direct function of intention to perform the behavior. Intention, in turn, is predicted by both attitudes and perceived social norms about the behavior. Beliefs about the outcomes of engaging in the behavior (e.g., use of condoms reduces pleasure) underlie attitudes. These outcome beliefs have two components—how likely the outcome is perceived to be and how good or bad it is considered. Similarly, normative beliefs underlie social norms, and these beliefs have two components—what specific others think one should do and how motivated one is to comply with their wishes.

A meta-analysis of studies of male condom use supports the theory of reasoned action.[20] However, the few studies focusing on heterosexually active men have tended to be based on small convenience samples of clients at STD clinics, adolescents or minority groups. A few large studies, based on national probability samples, have provided important information about heterosexually active men's sexual behaviors, including use of male condoms,[21] but they have not ascertained the men's beliefs about STD prevention methods.

In this article, we describe beliefs heterosexually active men hold about use of STD prevention methods; examine the relationship of these beliefs to men's characteristics; and examine the relationship of these beliefs to behavior, using longitudinal data. We use a theory-guided approach in a large, random sample of heterosexually active men. Notably, we elicited the beliefs from the men themselves, rather than generating a priori beliefs. This approach lends greater validity to the findings and imparts greater value to the information for those involved in STD prevention.

METHODS

The data come from a longitudinal study examining decisions about four methods for protecting against STDs—abstinence, monogamy, use of male condoms and use of female condoms—among heterosexually active men living in a large urban county in the northwestern United States. Data were collected in two phases. First, we used qualitative research to elicit beliefs about the four methods. Using results of content analysis of this information, we developed individual items tapping this content. In the second, quantitative phase, computerized interviews were conducted to explore men's beliefs and behaviors at study enrollment and again four months later. Both phases of the study were approved by the institutional review board of the University of Washington.

We selected interviewers on the basis of their understanding of research, comfort with sexual topics and ability to follow interview protocols. Interviewers were provided with referral information for participants who needed intervention services. For the qualitative phase, three men and three women of varying racial and ethnic backgrounds received intensive one-day training, including role-plays of interviews. Similar procedures were used to hire and train staff to oversee the computerized interviews in the main study. Interviewers were closely supervised by the study's principal investigator.

Sample Selection

To ensure maximal representation of men at risk for infection, participants in both phases of the study were randomly selected from areas with the highest rates of STDs in a large urban county in the northwestern United States. Using randomly selected telephone numbers from these areas, trained interviewers anonymously screened male household residents for eligibility. To be eligible, men had to be aged 18–40 and able to communicate adequately in English (as judged by the interviewer in conversation); they had to have been sexually active with a woman in the last two years and not exclusively sexually active with men in the last year. For both study phases, eligible men were asked if they were willing to take part in a study of men's sexual health; if more than one eligible man lived in the household, one was randomly selected for participation. Eligible men who agreed to participate provided written informed consent (including, for participants in the qualitative phase, consent to have sessions tape-recorded). Participants in the qualitative phase were not eligible for participation in the quantitative phase.

The men were not asked about their sexual orientation, but instead were asked about specific sexual behaviors in the past four months. Two percent reported penetrative sexual activity with a man, in addition to sexual activity with women. Because of our interest in abstinence as a method of STD prevention, we included men who reported no recent sexual activity.

Qualitative Phase

Thirty-one heterosexually active men—50% of those eligible—participated in the qualitative phase. The men ranged in age from 19 to 40 (mean, 29.3; standard deviation, 6.3); six were Asian men, seven were black, 16 were white and two were from other racial or ethnic groups. Eighty-three percent had some education beyond high school, and 65% had pretax annual incomes of $30,000 or more.

During in-person interviews, participants were asked a series of open-ended questions to elicit their outcome and normative beliefs about abstinence, mutual monogamy, use of male condoms and use of female condoms for STD prevention. Abstinence was defined as "choosing not to have penetrative sex (a man's penis in a partner's vagina, mouth or anus)." Mutual monogamy was defined as deciding "to have sex with only one woman and expect that the woman will not have other partners." The men were asked to name the "good and bad things" that would happen if they were to use each prevention method (i.e., outcomes), and to think of people in their lives who might have "opinions or attitudes" about their use of each. Probes were used to ensure that the full range of beliefs was elicited. The men were paid $30 for their participation.

Transcriptions of the tape-recorded responses, which con-

tained no names or other identifying information, were initially analyzed by the principal investigator. This analysis was based on the suggestions of Ajzen and Fishbein for the identification of salient outcome and normative beliefs.[22] Specific themes for outcome and normative beliefs for each prevention method were identified and illustrated with examples of text from the interviews, and were reviewed by the entire investigative team. The final belief items were based on the themes that occurred with the highest frequencies, which theoretically are the most salient beliefs.[23] These belief items were then pilot-tested in interviews with 20 men selected from the target population, and were refined for the larger study.

Quantitative Phase

Men were given a $50 incentive to come to the research office for the interview (98% chose this option), but could choose to be interviewed in another location, in which case they received a $40 incentive. The computer program provided instructions and definitions for the survey, and delivered the interview questions. This information was both displayed in text on the computer screen and available through earphones to help control for reading level. An interviewer was nearby to answer questions but could not see the men's responses.

A total of 486 men (51% of those eligible) participated in the first survey of the study's quantitative phase; these men ranged in age from 18 to 40 (mean, 30.1; standard deviation, 6.2). The majority (62%) were single and never-married; almost a third (30%) were currently married; and the remainder were separated (1%), divorced (6%) or widowed (0.4%). Forty-nine percent reported that they lived with a steady partner. Fifty-four percent were white, 23% were black, 10% were Asian, 6% were Hispanic, 1% were Native American, and 5% reported no primary racial affiliation or declined to answer the question. Overall, 56% of the men reported earning $31,201 or more annually; 80% reported some education beyond high school.

The men's mean age at first intercourse was 16.4 years (standard deviation, 3.3; median, 16). Their mean lifetime number of female partners was 21.7 (standard deviation, 36.8), but the median was 12, suggesting that a few men reported a large number of partners. Twelve percent reported ever having had sex with men; the majority (68%) of those encounters had occurred three or more years earlier. Nearly all of the men (92%) reported having had at least one sexual partner in the prior four months. During this time, most of these men (72%) had had one partner, 16% had had two, 7% had had three and 5% had had four or more. Only nine men reported having had sex with a man in the past four months. A quarter (24%) had had an STD; 1% were unsure about this. A majority of the men (73%) had been tested for HIV, but only three had tested positive.

Ninety-two percent of men who participated in the first quantitative survey returned for computerized interviews four months later. Apart having from slightly higher income and education levels, these men did not differ significantly from those participating in the first round.

Measures

To take advantage of the longitudinal data in the quantitative phase of the study, we used measures of beliefs and demographic characteristics from the initial survey, and obtained sexual behavior measures from the second survey.

• *Outcome beliefs.* Items were constructed to represent the expected outcomes for abstinence, monogamy, male condom use and female condom use that had been identified in the elicitation interviews. Beliefs about male and female condom use were asked separately by partner type—steady (defined as "someone you have an ongoing committed relationship with, like a girlfriend or wife") and casual (defined as "a woman you are not committed to and do not expect to have an ongoing, steady relationship with"). Following the theory outlined by Ajzen and Fishbein,[24] we assessed two aspects of each outcome: its perceived likelihood (expressed as a likelihood score) and an evaluation of how good or bad an occurrence of the outcome would be (expressed as an evaluation score). Likelihood scores ranged from 0 (very unlikely) to 6 (very likely). Evaluation scores ranged from 0 (not at all good) to 6 (very good) for desirable outcomes, from −6 (very bad) to 0 (not at all bad) for undesirable outcomes and from −6 (very bad) to 6 (very good) for outcomes that could be either desirable or undesirable (e.g., pregnancy).

The likelihood score and evaluation score for each outcome were multiplied to form the outcome belief score, which ranged from −36 to 36 (0 to 36 for positive outcomes and 0 to −36 for negative outcomes). Higher positive scores indicated that the respondent believed that the outcome would be both highly likely and very good. For each STD prevention method, the individual-level outcome belief scores (products) were averaged to obtain a mean outcome belief score, representing the cumulative effect of the individual's various outcome beliefs about the method. Insofar as an individual holds a preponderance of negative beliefs about the method, this average will be large and negative; with a preponderance of positive beliefs, it will be large and positive. If negative and positive beliefs are balanced, the average will be close to zero. Correlations between the mean outcome belief scores at the two surveys indicated that they were generally stable over time.*

• *Normative beliefs.* Normative beliefs about each STD prevention method also were scored on two dimensions: perceptions of the extent to which a specific individual (the normative referent) thinks the participant should or should not use the method (expressed as a support score) and the participant's motivation to comply with that referent's wishes (expressed as a motivation score). The former ranged from −3 (definitely should not) to 3 (definitely should). The latter ranged from 1 (very little) to 7 (very much). We multiplied the support score and motivation score for each referent to form the normative belief score.[25] These scores

*Abstinence, r=.64; monogamy, r=.60; use of male condoms with steady partners, r=.69; use of male condoms with casual partners, r=.58; use of female condoms with steady partners, r=.51; use of female condoms with casual partners, r=.36.

ranged from −21 to 21. Higher scores indicated that the participant perceived that the referent thought he should use the method, and that he was highly motivated to comply with that referent's wishes. For each method, the individual normative belief scores (products) were averaged to represent the mean normative belief score. As with the mean outcome belief score, the mean of the normative beliefs products represents the cumulative effect of the individual's normative beliefs. These means were generally stable over time.*

• *Sexual behaviors.* At the second survey, the men were asked about their use of the four prevention methods with each woman with whom they had had sex in the prior four months. They also were asked if they believed their main steady partner had had sex with others during that period. These items were used to construct the following sexual behavior variables: abstinence (scored zero for sexual intercourse, one for no sexual intercourse), monogamy (scored zero for nonmonogamous, one for monogamous) and condom use (proportion of anal and vaginal intercourse acts in which condoms were used).

• *Social and demographic characteristics.* We included social and demographic variables that have been shown to be consistently related to acquisition of STDs, including HIV.[26] Age was measured in years at the time of the initial survey. Marital status was measured as a dichotomous variable, scored one if the participant was married and living with his wife, and zero for any other arrangement. Race or ethnicity was based on self-report and was measured as a categorical variable (white, black, Asian, Hispanic or other). Socioeconomic status was measured by two variables: the highest level of formal education attained and income (measured as an ordinal variable).

TABLE 1. Means (and standard deviations) of scores for beliefs about various outcomes of practicing abstinence and mutual monogamy

Outcome belief	Likelihood score	Evaluation score	Outcome belief score†
Abstinence would:			
Protect me from HIV/STD	4.94 (1.91)	5.23 (1.76)	25.92 (13.88)
Allow me to know a woman better before getting involved	4.22 (1.80)	5.11 (1.20)	22.38 (11.59)
Prevent pregnancy	5.56 (1.38)	2.61 (3.76)	14.70 (21.81)
Fit my religious beliefs	1.85 (2.25)	3.36 (1.85)	7.83 (10.89)
Cause people to think something is wrong with me	2.95 (2.07)	−2.19 (1.83)	−7.66 (8.98)
Be sexually frustrating	4.66 (1.69)	−3.84 (1.55)	−19.01 (11.01)
Interfere with having a close relationship	4.68 (1.59)	−5.44 (0.99)	−25.72 (10.30)
Mean outcome belief score	na	na	2.28 (5.85)
Mutual monogamy would:			
Build trust and respect	5.47 (1.03)	5.79 (0.58)	31.94 (7.13)
Show I really love my partner	4.89 (1.44)	5.62 (0.81)	27.91 (9.53)
Protect me from HIV/STD	5.08 (1.28)	5.23 (1.76)	26.63 (11.30)
Mean I can satisfy my partner	4.57 (1.47)	5.72 (0.63)	26.34 (9.28)
Raise concerns about trusting my partner to be faithful	1.82 (2.04)	−5.37 (1.20)	−9.33 (11.26)
Mean I'd miss out on sex with other women	4.09 (2.21)	−2.03 (1.81)	−9.70 (10.22)
Mean outcome belief score	na	na	15.68 (5.49)

†Mean of products of individual-level likelihood and evaluation scores. *Notes:* Ns for abstinence items range from 447 to 484; for mutual monogamy items, 475–484. Likelihood scale range: 0 (very unlikely) to 6 (very likely). Evaluation scale range: 0 (not at all good) to 6 (very good) for desirable outcomes, −6 (very bad) to 0 (not at all bad) for undesirable outcomes and −6 (very bad) to 6 (very good) for outcomes that could be either (e.g., pregnancy). Outcome belief scale range: −36 to 36 (0 to 36 for positive outcomes, −36 to 0 for negative outcomes). na=not applicable.

RESULTS

Outcome Beliefs

Seven beliefs about abstinence were extracted from the qualitative interviews and included in the quantitative survey (Table 1). Likelihood scores indicated that the men believed that abstinence would likely protect them from acquiring STDs (4.9), help them get to know their partners better (4.2) and prevent pregnancy (5.6); but men also thought that abstinence would be sexually frustrating and would interfere with their having a close relationship (4.7 for each). They thought it not very likely that people would think something was wrong with them if they were abstinent (3.0), or that abstinence would fit their religious beliefs (1.9).

Evaluation scores show that men viewed preventing STDs and getting to know one's partner better as very positive outcomes of abstinence (5.2 and 5.1, respectively), but they held less-favorable views toward its fitting in with religious beliefs and preventing pregnancy (3.4 and 2.6). The outcome men rated most negatively was interference with having a close relationship (−5.4), followed by sexual frustration (−3.8) and having others think that something was wrong with them (−2.2).

Six beliefs about the outcomes of engaging in mutual monogamy were included in the main survey. Participants rated four of these—that monogamy would help them build trust and respect with their partner, show their love, avoid STDs and satisfy their partner—both very likely (likelihood scores, 4.6–5.5) and very desirable (evaluation scores, 5.2–5.8). They thought it likely that monogamy would make them miss having sex with other people, and this was seen as somewhat negative (likelihood and evaluation scores, 4.1 and−2.0, respectively). Raising concerns about trust was not seen as likely (1.8), but it was viewed as a very negative outcome (−5.4).

The qualitative interviews revealed eight beliefs about the outcomes of using male condoms, which were included in the main survey (Table 2). Consistent with prior research,[27] the men thought it quite likely that using male condoms with steady partners would protect them against STDs, give them control over protection and prevent pregnancies (likelihood scores, 4.2–5.0), but also that using male condoms would reduce their physical pleasure from sex (4.3). They thought it somewhat less likely that male condoms would feel like a barrier between them and their

*Abstinence, r=.54; monogamy, r=.53; use of male condoms with steady partners, r=.70; use of male condoms with casual partners, r=.50; use of female condoms with steady partners, r=.60; use of female condoms with casual partners, r=.32.

steady partners, and even less likely that male condoms would interrupt sex, cause them to lose their erections or cause their partners to become dry or sore.

Protection against STDs was viewed as a very positive outcome of male condom use (evaluation score, 5.3), as was having control over protection (4.0). Protection against pregnancy was viewed considerably less positively (1.3), probably because some men view pregnancy as desirable, whereas others do not. As expected, interrupting sex, feeling like a barrier, reducing pleasure from sex, interfering with ejaculation and making a partner dry or sore were seen as quite undesirable outcomes (−3.4 to−4.9).

A similar pattern emerged for outcomes of male condom use with casual partners. The exception was that preventing pregnancy was rated as a quite desirable outcome (4.5, compared with 1.3 for use with steady partners).

The survey included nine beliefs regarding the outcomes of using female condoms with steady partners. Men considered five of these—that the female condom would protect them from STDs, free them from using male condoms, interrupt sex less than male condoms, prevent pregnancy and give their partner greater control over protection—both fairly likely (2.8–4.2) and at least somewhat desirable (1.1–5.3). While they also considered it likely that the female condom would interrupt sex, make sex less pleasurable for them and their partner, and cause soreness or irritation for their partner (3.1–3.5), they viewed these outcomes quite negatively (−3.4 to −5.1).

A similar pattern of outcome beliefs emerged for use of female condoms with casual partners. However, the desirability of being freed from using a male condom was lower with regard to casual partners (2.9).

The mean outcome belief scores (i.e., averages of the individual-level outcome belief products) shown in the tables indicate that participants' overall beliefs were most favorable toward monogamy (mean score, 15.7) and least favorable toward their using male condoms with their steady partners (−2.0) and their steady partners' using female condoms (−0.9). Their beliefs about using male condoms with casual partners were somewhat favorable (3.3), as were their beliefs about their casual partners' using female condoms (2.8). Their beliefs were also somewhat favorable toward abstinence (2.3).

TABLE 2. Means (and standard deviations) of scores for beliefs about various outcomes of using male and female condoms with steady and casual partners

Outcome belief	Likelihood score	Evaluation score	Outcome belief score†
Using male condoms with a steady partner would:			
Protect me from HIV/STD	4.78 (1.24)	5.28 (1.69)	25.77 (10.46)
Give me control of protection	4.19 (1.87)	3.97 (1.60)	17.84 (11.65)
Prevent pregnancy	4.95 (1.12)	1.34 (4.15)	7.22 (20.92)
Cause me to lose my erection or be unable to ejaculate	1.74 (1.97)	–4.42 (1.47)	–7.78 (9.93)
Interrupt sex	2.71 (2.05)	–3.38 (1.80)	–10.96 (10.50)
Cause my partner to get dry or sore	2.61 (1.94)	–4.88 (1.29)	–12.90 (10.78)
Feel like a barrier between us	3.45 (2.14)	–3.83 (1.85)	–14.99 (12.19)
Give me less physical pleasure from sex	4.26 (1.86)	–4.01 (1.55)	–18.03 (11.26)
Mean outcome belief score	na	na	–2.00 (6.65)
Using male condoms with a casual partner would:			
Give me control of protection	4.66 (1.72)	5.32 (1.11)	25.38 (11.67)
Protect me from HIV/STD	4.79 (1.20)	5.20 (1.77)	25.20 (10.80)
Prevent pregnancy	5.07 (1.05)	4.54 (2.55)	22.76 (14.13)
Give me less physical pleasure from sex	3.68 (1.81)	–3.25 (1.53)	–12.45 (9.08)
Feel like a barrier between us	2.91 (2.18)	–2.19 (1.82)	–7.21 (8.71)
Cause me to lose my erection or be unable to ejaculate	1.89 (1.93)	–3.92 (1.76)	–7.86 (9.07)
Interrupt sex	2.38 (1.92)	–2.78 (1.84)	–8.08 (8.81)
Cause my partner to get dry or sore	2.64 (1.60)	–4.27 (1.57)	–11.26 (8.55)
Mean outcome belief score	na	na	3.25 (5.36)
Using female condoms with a steady partner would:			
Protect me from HIV/STD	3.25 (1.97)	5.28 (1.69)	17.27 (12.43)
Free me from using a male condom	3.77 (2.13)	4.06 (1.69)	16.22 (11.94)
Interrupt sex less than a male condom	2.75 (1.47)	3.31 (1.84)	8.62 (7.99)
Prevent pregnancy	4.24 (1.44)	1.34 (4.15)	6.44 (18.48)
Give her more control over protection	3.61 (1.81)	1.07 (1.41)	4.90 (6.60)
Interrupt sex	3.49 (1.79)	–3.38 (1.80)	–11.89 (10.77)
Give me less pleasure from sex	3.24 (1.86)	–4.01 (1.55)	–13.56 (10.74)
Cause my partner to get sore or irritated	3.06 (1.51)	–5.07 (1.17)	–15.71 (9.37)
Give her less pleasure from sex	3.55 (1.72)	–4.84 (1.41)	–17.88 (10.75)
Mean outcome belief score	na	na	–0.85 (4.94)
Using female condoms with a casual partner would:			
Protect me from HIV/STD	3.47 (1.84)	5.20 (1.77)	18.37 (12.05)
Prevent pregnancy	4.16 (1.48)	4.44 (2.55)	18.28 (13.25)
Free me from using a male condom	2.97 (2.25)	2.86 (1.98)	10.86 (10.53)
Interrupt sex less than a male condom	2.64 (1.41)	2.72 (1.85)	6.08 (6.97)
Give her more control over protection	4.24 (1.61)	0.98 (1.68)	5.60 (8.26)
Give me less pleasure from sex	2.74 (1.66)	–4.01 (1.55)	–5.23 (7.56)
Interrupt sex	3.02 (1.66)	–2.78 (1.84)	–6.78 (7.36)
Cause my partner to get sore or irritated	2.63 (1.06)	–4.52 (1.32)	–11.88 (5.50)
Give her less pleasure from sex	3.10 (1.57)	–4.22 (1.42)	–13.32 (8.75)
Mean outcome belief score	na	na	2.75 (3.57)

†Mean of products of individual-level likelihood and evaluation scores. *Notes*: Ns for use of male condoms with steady partner items range from 331 to 365; for use of male condoms with casual partner items, 121–130; for use of female condoms with steady partner items, 175–348; for use of female condoms with casual partner items, 31–121. Likelihood scale range: 0 (very unlikely) to 6 (very likely). Evaluation scale range: 0 (not at all good) to 6 (very good) for desirable outcomes, –6 (very bad) to 0 (not at all bad) for undesirable outcomes and –6 (very bad) to 6 (very good) for outcomes that could be either (e.g., pregnancy). Outcome belief scale range: –36 to 36 (0 to 36 for positive outcomes, –36 to 0 for negative outcomes). na=not applicable.

Normative Beliefs

In the qualitative interviews, men indicated that they thought that four referents cared about whether they used abstinence to protect themselves: close friends, health care providers, family members and friends at church. For the other STD prevention methods, they named these four plus their partners (steady or casual).

Support scores from the main survey (Table 3, page 126) indicate that the men perceived little support among any referents for abstinence (−0.1 to 0.9). In contrast, the men perceived all referents, especially steady partners, as wanting them to be monogamous (1.9–2.6). Perceived norms about using male condoms with steady partners varied by referent; whereas all but steady partners were seen as slightly supportive of male condom use, steady partners were seen as slightly opposed. Men viewed all referents as supporting the use of male condoms with casual partners (2.0–2.7), but they considered casual partners to be somewhat less supportive than others. Most referents were viewed as being nearly neutral regarding use of female condoms with steady partners, but steady partners were thought to be against their use (−2.2). Participants considered all referents to be just slightly supportive of casual partners' using

TABLE 3. Means (and standard deviations) of scores reflecting men's beliefs about the extent to which various referents support their using STD prevention methods and the extent to which men are motivated to comply with referent's wishes

Referent	Support score						Motivation score
	Abstinence	Mutual monogamy	Male condom use		Female condom use		
			With steady partner	With casual partner	With steady partner	With casual partner	
Close friends	–0.07 (1.72)	1.89 (1.32)	0.61 (1.72)	2.45 (1.05)	–0.10 (1.17)	0.32 (1.42)	3.26 (1.55)
Health care providers	0.39 (1.74)	2.06 (1.28)	0.89 (1.74)	2.67 (0.88)	0.19 (1.42)	1.28 (1.53)	5.51 (1.49)
Family	0.45 (1.81)	2.25 (1.17)	0.73 (1.77)	2.71 (0.79)	–0.06 (1.24)	0.73 (1.46)	4.03 (1.61)
Church friends	0.93 (1.93)	2.04 (1.42)	0.48 (2.00)	2.56 (0.97)	0.14 (1.58)	1.08 (1.52)	3.50 (1.96)
Steady partner	u	2.61 (1.09)	–0.66 (2.30)	u	–2.15 (1.38)	u	5.64 (1.18)
Casual partner	u	u	u	1.98 (1.42)	u	0.03 (1.67)	4.92 (1.53)
Mean normative belief score†	1.26 (6.95)	9.81 (5.01)	1.59 (7.55)	10.80 (4.57)	–1.83 (5.34)	2.87 (5.84)	na

†Mean of products of individual-level support and motivation scores for the method. *Notes:* Support scale range: –3 (definitely should not use the method) to 3 (definitely should use the method). Motivation scale range: 1 (very little motivation to comply with referent's wishes) to 7 (very much motivation to comply). Normative belief scale range: –21 to 21. u=unavailable, because item was not asked about this referent. na=not applicable.

female condoms; health care providers and church friends were seen as the most supportive.

The men were most motivated to comply with the wishes of their steady partners (motivation score, 5.6), but also fairly motivated to comply with casual partners' wishes (4.9). They were also very motivated to comply with their health care providers' and family members' wishes (5.5 and 4.0), but only somewhat motivated to comply with the wishes of close friends and friends from church (3.3 and 3.5).

According to the mean normative belief score (i.e., the average of the individual-level normative belief products) for each method, men's beliefs were most favorable toward using male condoms with casual partners (mean score, 10.8) and monogamy (9.8). They were moderately favorable toward using female condoms with casual partners (2.9) and slightly favorable toward using male condoms with steady partners (1.6) and abstinence (1.3). Normative beliefs were least favorable toward steady partners' using female condoms (−1.8).

TABLE 4. Coefficients from regression analyses examining associations between mean outcome and normative beliefs and men's characteristics

Characteristic	Abstinence	Mutual monogamy	Male condom use		Female condom use	
			With steady partner	With casual partner	With steady partner	With casual partner
Outcome beliefs	(N=463)	(N=468)	(N=354)	(N=123)	(N=177)	(N=59)
Married	–.27***	.27***	–.26***	.15	–.34***	.08
Age	–.16***	–.05	–.06	–.25***	.01	–.13
Race/ethnicity						
Asian	–.02	.01	–.12*	–.04	.05	–.16
Black	.05	–.08	–.13*	.14	–.10	.17
Hispanic	.01	.02	.03	.06	.08	–.06
Other	–.04	–.03	–.04	–.02	–.15*	.27
Income	–.09	.01	–.01	.04	–.02	–.06
Education	–.01	–.01	.06	.20	.10	.17
R^2	*.16***	*.08***	*.10***	*.12**	*.14***	*.15*
Normative beliefs	(N=402)	(N=449)	(N=340)	(N=121)	(N=69)	(N=56)
Married	–.06	.29***	–.41***	–.06	–.37**	–.11
Age	–.07	–.03	–.12*	–.08	–.04	.01
Race/ethnicity						
Asian	.12*	.01	.04	–.11	.07	–.07
Black	.25***	–.03	–.02	–.01	.12	.52**
Hispanic	.11*	.01	.03	–.08	.12	.28
Other	.04	–.08	–.00	–.08	–.07	–.01
Income	–.08	.01	.02	–.05	–.04	–.11
Education	–.08	.07	.09	.24*	–.05	.31
R^2	*.13***	*.11***	*.20***	*.07*	*.21*	*.26*

*p≤.05. **p≤.01. ***p≤.001. *Notes:* Reference group for marital status was unmarried men; for race/ethnicity, white. Income and education were measured as ordinal variables. Mean outcome and normative belief scores are the averages of the cross-products for each method.

Relation of Beliefs to Men's Characteristics

We performed separate multiple regression analyses in which the mean outcome and normative belief scores (cross-products) for each method were the criterion variables. The men's social and demographic characteristics were entered simultaneously as predictor variables. For race or ethnicity, white was the excluded (reference) category.

Of the five social and demographic variables, only marital status was consistently related to overall outcome and normative beliefs (Table 4). It was related to all beliefs about using condoms (male or female) except for beliefs (both outcome and normative) about using condoms with casual partners. Relative to other men, those who were married and living with their wives held outcome beliefs that were more favorable toward monogamy and less favorable toward using male or female condoms with their steady partners (i.e., their wives). Similarly, relative to other men, married men held normative beliefs more strongly in favor of monogamy, but less in favor of using male or female condoms with their steady partners. There was no difference between married and other men regarding their normative beliefs about abstinence.

Age was related to three beliefs: The older the man, the less his outcome beliefs favored abstinence or using male condoms with casual partners, and the less support he perceived for using male condoms with steady partners.

There were few differences in either outcome or normative beliefs across racial and ethnic groups. Relative to white men, black men held outcome beliefs that were slightly less favorable toward using male condoms with their steady partners, and they held normative beliefs that were more favorable toward abstinence and using female condoms with casual partners. Asian men held slightly less favorable outcome beliefs about using male condoms with steady partners and slightly more favorable normative be-

liefs about abstinence. The only difference between Hispanic and white men was that Hispanic men held normative beliefs that were slightly more favorable toward abstinence than those of white men. Men of other races or ethnicities differed from white men only in their slightly less favorable outcome beliefs about using female condoms with steady partners.

Neither education nor income was related to any of the beliefs, except that relative to less-educated men, men with more education held normative beliefs more favorable toward using male condoms with casual partners.

Relation of Beliefs to Sexual Behaviors

We computed correlations between the mean outcome and normative beliefs measured at the first survey and the respective sexual behaviors (i.e., use of the respective prevention methods) reported four months later. (Because of the extremely low frequency of female condom use reported at the second survey, the relationship was not examined for this method.)

Men's outcome beliefs about the three methods were significantly related to the respective behaviors: abstinence ($r=.14$, $p=.005$), monogamy ($r=.27$, $p<.001$) and using male condoms with steady partners ($r=.36$, $p<.001$). However, their beliefs about using male condoms with casual partners were not related to actual condom use with casual partners.

Normative beliefs about two prevention strategies were significantly related to these behaviors: monogamy ($r=.15$, $p<.01$) and using male condoms with steady partners ($r=.56$, $p<.001$). However, normative beliefs about abstinence and using male condoms with casual partners were not significantly related to behavior.

DISCUSSION

The heterosexually active men in this study held beliefs about each of the four disease prevention methods that included both positive and negative anticipated outcomes. For example, although they believed that abstinence would be sexually frustrating and interfere with the development of a close relationship, they also believed that it would facilitate their getting to know a woman before they became involved with her. Moreover, the men were much more positive about monogamy than might be expected: The mean outcome belief score for monogamy far exceeded that for any other method. In contrast, the men's beliefs about using male or female condoms with steady partners were slightly negative, although they anticipated a few benefits, such as protection against STDs. Whereas beliefs about using condoms (male or female) with casual partners were more positive than those about using them with steady partners and were very slightly favorable, the men nonetheless held several negative beliefs about condom use even with casual partners.

Outcome beliefs toward abstinence were also very slightly favorable, but the men perceived little normative support for it. Thus, convincing men to adopt abstinence as a prevention method likely will be challenging. Interventions that reinforce men's positive beliefs about abstinence (e.g., it allows them to get to know a women better before they become involved) without countering negative beliefs (e.g., sexual frustration) or increasing normative support for it will likely be ineffective. Men could be taught ways to satisfy themselves and their partners without penetration as one possible means of countering the belief that abstinence is sexually frustrating. Given a cultural context in which sex is defined as very important, and the negative beliefs about and lack of normative support for abstinence, other methods of STD prevention are likely to be more attractive to heterosexually active men.

Men's overall favorable disposition toward mutual monogamy suggests that this may be a viable prevention strategy for heterosexually active men. Nevertheless, prevention efforts focusing on monogamy will have to address men's unfavorable beliefs about missing out on sex with other partners, perhaps by teaching men, and their partners, ways to create novelty in their sexual relations. Prevention efforts will also have to address men's concerns that their partners might be unfaithful. Moreover, at some point a monogamous partner was a new, infrequent or casual partner, so the question must be raised as to how best to help couples decide when it is reasonably safe to stop using condoms when they are in a monogamous relationship.

Capitalizing on men's favorable disposition toward monogamy also may be fruitful in view of their negative beliefs about using condoms with steady partners. Furthermore, rather than encouraging men to use condoms consistently with all partner types, a strategy that has met with limited success, it might be wiser to encourage men to use condoms consistently with new, infrequent or casual partners. Interventions that reinforce the positive expected outcomes of condom use as well as counter negative beliefs are likely to be the most effective. Health care providers who wish to encourage use of female condoms ought to discuss this method with heterosexually active men to counter their negative beliefs (e.g., that female condoms reduce pleasure for both him and her) and reinforce their positive beliefs (e.g., female condoms interrupt sex less than male condoms).

The finding that the men felt quite motivated to comply with their health care providers' advice is encouraging. This finding should encourage health care providers to discuss methods of protection against STDs with heterosexually active men and to encourage their use. As might be expected, the men were more motivated to comply with steady partners' wishes than with those of casual partners. With the exception of using male condoms with casual partners (which they perceived their close friends as supporting), the men perceived their close friends as being relatively neutral about their use of methods of protection. Interventions may be most likely to succeed if they increase normative support for these methods and pay special attention to the wishes of steady partners. The importance of partner norms cannot be overestimated. In other analyses, we have found that partner norm has a consistent, although indirect, effect on the practice of monogamy, the use of condoms with steady partners and intentions to use condoms with casu-

al partners among heterosexually active men.[28]

The importance of understanding heterosexually active men's beliefs about STD prevention methods is underscored by our findings that virtually all of these beliefs were related to the men's actual behaviors. That the correlations were modest in size no doubt reflects that other variables (e.g., intentions, attitudes, social norms and self-efficacy) are also important predictors of such behaviors. The primary exception was that neither outcome beliefs nor normative beliefs about using condoms with casual partners were related to their use. This may reflect that men change casual partners often enough to keep them from forming stable beliefs about use of methods of protection with such partners.

Men's marital status was the characteristic most consistently related to their beliefs about the prevention methods. Clinicians should recognize that the same safer-sex strategies might not be appropriate for married and single men. Of the 48 comparisons of beliefs by race or ethnicity, only seven were significant. This finding suggests that by and large, men from different racial or ethnic groups hold fairly similar beliefs about the four methods of protection. The exceptions should be taken into account in prevention interventions.

Socioeconomic status (measured by education and income) showed little relationship to beliefs. The finding that education was related to men's normative beliefs about using male condoms with casual partners suggests that efforts to change norms about condom use, especially among men with less education, might augment efforts to encourage condom use. Because STDs are most prevalent among heterosexually active individuals living in inner cities, where the proportion of poor individuals is highest,[29] efforts to change norms in those communities should take high priority.

In summary, generally the outcome and normative beliefs about the four prevention methods were widely shared by the men in our sample. To the extent that these findings are generalizable and indicate that some tailoring of interventions is warranted, the results suggest that clinicians and health educators need not extensively tailor interventions on the basis of men's demographic and socioeconomic characteristics.

Some study limitations bear mentioning. Although the men were randomly sampled, the sample was drawn from a specific area of the country that may or may not be representative of the country as a whole. It is a geographic area of the United States that has neither the highest nor the lowest rates of HIV and other STDs. The study was restricted to men who can speak English, and we do not know to what extent the findings apply to those who cannot; this would be an interesting question for future research. The response rate was 51%, and we have no information with which to compare those who agreed to participate with those who did not; therefore, we cannot assess the degree of bias in the sample. Finally, although beliefs are important factors in decisions about behaviors that protect against STDs and represent important avenues of intervention, other factors, such as intentions, attitudes and self-efficacy, are equally important to investigate in future research with heterosexually active men.

In conclusion, we hope that people working toward preventing HIV and other STDs will find this information about heterosexually active men's beliefs about four methods of disease prevention useful for intervention efforts. Prior work with heterosexually active black male adolescents has demonstrated that interventions including components that counter negative beliefs and encourage positive beliefs about using male condoms can be effective.[30] Building on this work, we believe that identifying heterosexually active men's outcome beliefs and normative referents for protective behaviors is important for effective intervention.

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