

Associations of a Sexually Transmitted Disease Diagnosis During a Relationship with Condom Use and Psychosocial Outcomes: (Short) Windows of Opportunity

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Abstract Few studies have examined whether and how receiving an sexually transmitted disease (STD) diagnosis while in a romantic relationship relates to condom use and psychosocial sexual outcomes. Using dyadic data, we examined associations of a personal or a partner's STD diagnosis during a relationship with condom use, monogamy intentions, condom intentions and attitudes, and STD susceptibility and communication. Because beliefs about how the STD was acquired may shape associations with behavior and cognitions, gender and suspecting that one's partner had other sexual partners (i.e., partner concurrency) were examined as moderators. Participants were 592 individuals in 296 couples expecting a baby; 108 individuals had been diagnosed with an STD during the relationship. Personal STD diagnosis was unrelated to outcomes or was associated with increased risk. A partner's diagnosis related to more positive condom intentions and attitudes. Among men who suspected concurrency, both a personal and a partner's STD diagnosis were associated

with less condom use. Receiving the STD diagnosis during pregnancy was associated with greater susceptibility and marginally greater condom use. Results suggest potential benefits of enhancing communication and encouraging joint risk reduction counseling among couples, engaging men more fully in preventive efforts, and capitalizing on the short window during which risk reduction occurs.

Keywords Sexually transmitted diseases · Adolescents · Couples · Condom use

Introduction

Sexually transmitted diseases (STDs) pose a significant health threat for adolescents and young adults. There are an estimated 18.9 million new STD diagnoses each year, with adolescents and young adults accounting for almost half of these diagnoses (Weinstock et al. 2004). The highest rates of chlamydia and gonorrhea are found among young men and women ages 15–24 (CDC 2010). Ethnic minorities are disproportionately affected by STDs. Rates of gonorrhea among African Americans and Hispanics are 18 and two times higher, respectively, than the rates observed among Whites (CDC 2010). Prevalence of STDs is also high among pregnant adolescents. Approximately 24 % of pregnant adolescents have a history of STDs, while 29 % are diagnosed with an STD during pregnancy (Meade and Ickovics 2005). Increased risk of STD diagnosis has also been observed postpartum (Ickovics et al. 2003).

A number of factors have been identified that are associated with increased risk for contracting an STD. Behavioral factors, including younger age at first intercourse, having multiple sex partners, and engaging in unprotected intercourse, are associated with increased risk

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(DiClemente et al. 2005; Kaestle et al. 2005; Robertson et al. 2005). Furthermore, having been previously diagnosed with an STD is one of the strongest predictors of a new STD diagnosis (Crosby et al. 2000; DiClemente et al. 2002; Kershaw et al. 2004). Reinfection may result from a relationship with an untreated partner or continuation of risky behaviors (DiClemente et al. 2002; Whittington et al. 2001). It is important to understand how individual characteristics are associated with behavior following an STD diagnosis, as this may be an opportunity for intervention and behavior modification.

Research examining the relationship of an STD diagnosis to behavior and psychosocial beliefs has yielded mixed results. An STD diagnosis has been associated with increased condom use, intentions for condom use, and perceptions of susceptibility to contracting HIV (Crosby et al. 2004; Fortenberry et al. 2002; Venable et al. 2007). However, additional research has found no relationship between STD diagnosis and condom use, intentions, attitudes, or perceptions of susceptibility to STDs (Kershaw et al. 2004; Sheeran and Taylor 1999). Increased risk behaviors, including lower rates of condom use, have also been documented (DiClemente et al. 2002; Venable et al. 2007), suggesting that risky behaviors may persist despite an STD diagnosis. These conflicting results highlight the need for closer examination of factors that may moderate associations of an STD diagnosis to condom use and related psychosocial sexual risk outcomes.

Previous research has evidenced a number of shortcomings that limit our knowledge of the circumstances under which an STD diagnosis is associated with protective sexual behaviors and beliefs. First, associations of an STD diagnosis with condom use and psychosocial sexual risk outcomes in the context of a steady romantic relationship have not been considered. Individuals are more likely to disclose an STD diagnosis to a main partner (Gorbach et al. 2000), potentially leading to greater discussion about sexual risk and more resolve to utilize protective precautions than would occur among non-committed sexual partners. Second, previous research has typically focused on females, and when males have been included, has not examined gender differences. Third, research has not examined how beliefs about a sexual partner might influence whether an STD diagnosis is associated with more protective behaviors. Suspecting that a partner has had other sexual partners during the relationship is associated with increased condom use (Brady et al. 2009). Coupled with an STD diagnosis, suspecting partner concurrency may strengthen convictions to take protective precautions.

The present research sought to address these gaps in the literature by examining the association of an STD diagnosis during the current relationship with psychosocial sexual risk among a sample of primarily African American

and Hispanic pregnant adolescents and their male partners. Our sample is an important one in which to consider associations of an STD diagnosis given increased risk for STDs among ethnic minorities and pregnant adolescents. Because most adolescents in relationships view condoms primarily as a means for preventing pregnancy (Cooper et al. 1999), our pregnant sample likely provides a conservative estimate of associations of an STD diagnosis to condom focused outcomes. However, because pregnant women are attuned to subtle indications of risk for diseases that could harm the fetus (Navarrete et al. 2007), associations between STD diagnosis and STD focused outcomes (e.g., STD susceptibility), may be particularly strong among the women in our sample.

We examined whether either personally being diagnosed with an STD or having a partner who was diagnosed during the relationship was associated with condom use, intentions for both using condoms and remaining monogamous, attitudes toward condoms, perceived susceptibility to contracting an STD, and communicating with sexual partners about STDs. We also explored whether the association of a personal or a partner's STD diagnosis during the relationship to condom use and the psychosocial sexual risk outcomes was moderated by either gender or suspected partner concurrency. Because suspicions of infidelity may elicit different responses from males and females (Trivers 1972), we also examined the three way interaction of a personal or a partner's STD diagnosis with gender and suspected partner concurrency in predicting condom use and the psychosocial sexual risk factors. Finally, we examined whether associations of a personal or a partner's STD diagnosis with outcomes depended on the amount of time that had elapsed since the STD diagnosis.

Methods

Study Sample and Procedures

The data utilized in this study were drawn from the baseline interview of a larger study of pregnant adolescent women and their male partners ($n = 592$). In all, 296 couples were recruited from obstetrics clinics and an ultrasound clinic in four university-affiliated hospitals located in urban areas throughout Connecticut. Inclusion in the study required that the woman be 23 or more weeks pregnant, in a confirmed romantic relationship with the biological father of the baby, and between the ages of 14 and 21. Men were required to be age 14 or older. Both partners were required to speak English or Spanish and to consent to participate in the study.

Each participant completed a structured interview administered via audio computer-assisted self-interview

(ACASI). Time to complete interviews ranged between 1 and 2 h, with most requiring approximately 1.5 h. All procedures were approved by the Yale University Human Investigation Committee and by Institutional Review Boards at the study clinics. Participants provided written informed consent prior to participation in the baseline assessment. Participation was voluntary and confidential and did not influence the provision of health care. Each participant received \$25 in exchange for participation.

Measures

STD Diagnosis During The Current Relationship

Participants self-reported whether they had ever been diagnosed with chlamydia, gonorrhea, trichomonas, herpes, genital warts, and/or syphilis. If an STD had been diagnosed, the month and year of the most recent diagnosis of each STD was assessed. Participants also reported the month and year in which the relationship with their partner began. Those who reported having been diagnosed with any STD since the current relationship began were classified as having been diagnosed during the current relationship. All other participants were considered to not have been diagnosed during the current relationship.

Suspected Partner Concurrency

Participants reported whether their partner ever had sexual intercourse with someone else during the relationship on a 5-point scale ranging from “definitely no” to “definitely yes”. Those who reported that their partner “definitely” or “probably” had another sexual partner were classified as suspecting partner concurrency. All others were classified as not suspecting concurrency.

Demographics

Age in years, gender, ethnicity (Black, Hispanic, White/other), gestational age in weeks, education (in school/12 or more years completed vs not in school), age at first sexual intercourse, average number of sexual partners per year of sexual activity, and length of the current relationship in months were assessed.

Outcome Measures

Condom Use

Condom use in the previous month was calculated from the number of times a participant had engaged in sexual intercourse with each of up to 4 sexual partners and the number of those acts in which a condom was used. The

proportion of protected acts was calculated for each sexual partner. In all, 1.5 % ($n = 9$) of participants reported intercourse with at least one individual other than the mother or father of the baby. In order to fully capture the extent of condom use among those reporting secondary partners, the measure of condom use was created by aggregating the proportion of protected acts across all sexual partners.

Condom Use Intentions

Intentions to use condoms were measured by the item “In the next year, I will make sure a condom is used when I have sex” (Lux and Petosa 1994). Participants rated the statement on a 1–4 scale ranging from “disagree” to “agree.”

Monogamy Intentions

Intentions to be monogamous were assessed by one item, “In the next year, I will only have one sexual relationship at a time” (Lux and Petosa 1994). The item was rated on a 1–4 scale ranging from “disagree” to “agree.”

Condom Attitudes

Attitudes toward condoms were assessed by 9 items adapted from the Multidimensional Condom Attitude Scale (Helweg-Larsen and Collins 1994). Items assessed the efficacy, enjoyability, and stigma of condoms. For example, “The condom is a highly satisfactory form of contraception” and “Condoms ruin the sex act.” Items were rated on a 7-point scale ranging from “strongly disagree” to “strongly agree.” The sum of the items served as the scale score. Reliability of the scale was acceptable ($\alpha = 0.72$).

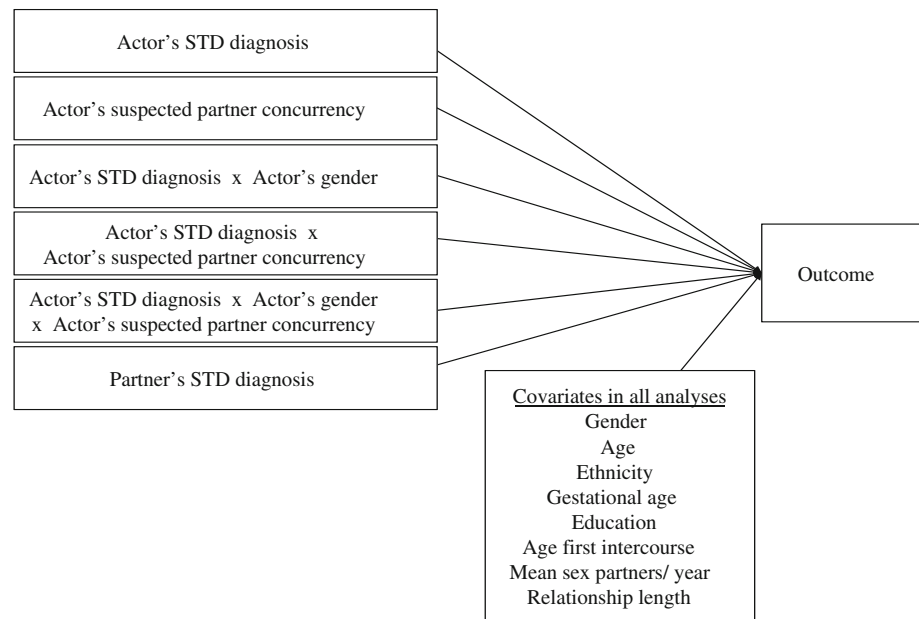
Perceived Susceptibility to STDs

Perceived susceptibility to contracting an STD in the future was measured by a single item assessing the likelihood of “getting a sexually transmitted disease like chlamydia or gonorrhea in the next year.” The item was rated on a 1–4 scale ranging from “no chance” to “a good chance.”

STD Communication

Communication with sexual partners about STDs and HIV was assessed by five items, including “I ask my partners about their STD history.” Items were rated on a 1–5 scale ranging from “never” to “very often.” Reliability was good ($\alpha = 0.86$).

Fig. 1 Representation of models estimated to examine three-way and lower order interactions in the context of the actor–partner interdependence model



Data Analysis

Frequencies and means were examined to describe those who had been diagnosed with an STD during the current relationship and those who had not. Differences between the groups on categorical outcomes were analyzed with McNemar tests; continuous outcomes were analyzed with multilevel modeling.

Due to the dyadic nature of the data and because we wanted to examine associations between a partner's STD diagnosis and one's own outcomes, we assessed the Actor-Partner Interdependence Model (APIM; Kenny et al. 2006) in the multilevel modeling framework. The APIM allows for the inclusion of the responses of both members of a dyad in a single analysis, while controlling for the nested structure of the data. Multilevel modeling (or hierarchical linear modeling) treats the members of a dyad as nested scores within the same group (Kenny et al. 2006). The APIM approach is ideal because it allows for assessment of both actor and partner effects. Actor effects refer to whether an individual's score on a predictor influences the individual's own outcome (e.g., woman's personal STD diagnosis relates to her own condom use). Partner effects refer to whether a partner's score on the predictor influences the individual's outcome, above and beyond the actor effect (e.g., man's STD diagnosis relates to the woman's condom use). All continuous variables were centered at the mean of the total sample, which is the recommended approach when centering variables in the APIM (Kenny et al. 2006). Categorical variables were dummy coded. All analyses included demographic variables as covariates

(i.e., age, gender, ethnicity, gestational age, education, age at first sexual intercourse, average number of sexual partners per year, and relationship length). The coefficients presented for the actor and partner effects represent the unstandardized regression coefficients.

We examined whether associations of an actor's or partner's STD diagnosis to each outcome depended on gender or suspected partner concurrency. We first examined the three-way interaction of STD diagnosis, gender, and suspected partner concurrency. Figure 1 depicts the specification of the three-way interaction between actor STD diagnosis, gender, and suspected partner concurrency. The same approach was used for examining the three-way interaction of partner STD diagnosis, gender, and suspected partner concurrency. For outcomes that were not qualified by a significant three-way interaction, we also examined two-way interactions between actor or partner STD diagnosis and gender and between actor or partner STD diagnosis and suspected partner concurrency. The two-way interactions of both actor and partner STD diagnosis and gender were examined simultaneously. Similarly, the two-way interactions of both actor and partner STD diagnosis and suspected partner concurrency were examined simultaneously.

To examine whether associations of an STD diagnosis with condom use and psychosocial sexual outcomes depended on the amount of time that had elapsed since the diagnosis, a subanalysis was conducted of participants who had been diagnosed with an STD during their current relationship ($n = 108$; 18%). All covariates and the number of months since the last STD diagnosis were included as predictors of each outcome.

Table 1 Sample characteristics stratified by STD diagnosis status

Demographics	STD diagnosis during current relationship		<i>p</i> value
	Yes (<i>n</i> = 108)	No (<i>n</i> = 484)	
Age [M (SD)]	19.6 (2.8)	20.1 (3.5)	0.091
Gender [N (%)]			
Female	74 (25.0)	222 (75.0)	<0.001
Male	34 (11.5)	262 (88.5)	
Ethnicity [N (%)]			
Black	67 (25.7)	194 (74.3)	0.027
Hispanic	25 (11.1)	200 (88.9)	
White/other	16 (15.1)	90 (84.9)	
Gestational age (weeks) [M (SD)]	29.18 (5.2)	29.04 (5.3)	0.269
Education [N (%)]			
In school/12+ years completed	80 (17.8)	370 (82.2)	<0.001
Not in school	28 (20.0)	112 (80.0)	
Age at first intercourse [M (SD)]	14.5 (2.0)	14.7 (2.8)	0.756
Average number of partners per year sexually active [M (SD)]	2.12 (1.6)	1.62 (1.6)	0.014
Relationship length (months) [M (SD)]	28.19 (21.0)	26.64 (19.5)	0.292
Suspected partner concurrency [N (%)]			
Yes	35 (35.7)	63 (64.3)	0.440
No	73 (14.8)	419 (85.2)	

Results

Participants were predominantly Black (44 %) or Hispanic (38 %); 14 % identified as White and 4 % some other race/ethnicity. Women were, on average, 18.7 years old ($SD = 1.7$) and men, 21.3 years old ($SD = 4.1$). The average duration of the relationship was 2 years and 3 months. Mean gestational age was 29.1 weeks. The majority of participants (58 %) reported that someone else served as their main source of financial support; the median household income was \$7,500 per year.

In all, 108 individuals had been diagnosed with an STD during the current relationship. The median length of time since the last STD diagnosis was 6.2 months; mean time since the diagnosis was 11.8 months. In total, 77 couples were affected by an STD diagnosis. In 31 couples, both partners had been diagnosed. In 46 couples, only one partner had been diagnosed with an STD. Personally being diagnosed with an STD during the current relationship was related to having a partner who had also been diagnosed with an STD during the relationship ($r = 0.48$, $p < .001$). Of participants diagnosed with an STD, most (74 %) had been diagnosed with chlamydia; 17 % were diagnosed with gonorrhea and 12 % with genital warts. Diagnoses of trichomonas, herpes, and syphilis were less common (8, 6, and 1 %, respectively).

Demographic comparisons of participants who had been diagnosed with an STD during their current relationship

with those who had not are presented in Table 1. Individuals diagnosed with an STD were more likely to be female, were more likely to be Black, were less likely to be in school, had more sexual partners per year of sexual activity, and were marginally younger.

Associations of an STD diagnosis during the relationship with condom use and psychosocial sexual risk outcomes are given in Table 2. Personally being diagnosed with an STD during the relationship was associated with lower intentions for using condoms and lower intentions for being monogamous in the future. A personal STD diagnosis was also associated with marginally greater perceptions of susceptibility for contracting an STD in the future. Having a partner who had been diagnosed with an STD suggested a more positive association with outcomes, relative to one's own diagnosis. A partner's STD diagnosis during the relationship was associated with both marginally greater intentions for condom use and marginally more positive attitudes toward condoms. All other outcomes evidenced no relationship to either personal or a partner's STD diagnosis.

A personal STD diagnosis during the relationship significantly interacted with gender and suspected partner concurrency in the prediction of both condom use ($t = 2.21$, $p = .03$) and condom attitudes ($t = 1.95$, $p = .05$). Plots of the simple effects for each interaction are presented in Figs. 2 and 3, respectively. Among men who suspected partner concurrency, personally being diagnosed with an

Table 2 Relationship of STD diagnosis and demographic variables to condom use and psychosocial outcomes

	Condom use		Condom use intentions		Monogamy intentions		Perceived susceptibility to STDs		Condom attitudes		STD communication	
	B (SE)	t test	B (SE)	t test	B (SE)	t test	B (SE)	t test	B (SE)	t test	B (SE)	t test
STD diagnosis												
Actor	0.40 (3.21)	0.13	-0.25 (0.11)	-2.34*	-0.14 (0.08)	-1.82 ⁺	0.10 (0.06)	1.75 ⁺	-0.40 (1.09)	-0.37	0.12 (0.14)	0.84
Partner	0.64 (3.29)	0.19	0.19 (0.11)	1.77 ⁺	-0.05 (0.08)	-0.64	0.05 (0.07)	0.72	1.94 (1.10)	1.77 ⁺	0.00 (0.14)	0.02
Demographics												
Age	0.27 (0.42)	0.65	-0.02 (0.01)	-1.61	0.00 (0.01)	0.53	0.01 (0.01)	1.29	0.14 (0.13)	1.15	0.04 (0.02)	2.16*
Gender												
Men	Referent		Referent		Referent		Referent		Referent		Referent	
Women	-3.21 (2.28)	-1.41	0.02 (0.08)	-0.20	0.19 (0.01)	3.21**	-0.07 (0.05)	-1.42	2.30 (0.83)	2.77**	0.42 (0.10)	4.10**
Ethnicity												
White/other	Referent		Referent		Referent		Referent		Referent		Referent	
Black	8.69 (3.47)	2.50**	0.55 (0.11)	5.18**	0.10 (0.08)	1.31	0.04 (0.06)	0.63	2.45 (1.04)	2.36*	0.39 (0.14)	2.81**
Hispanic	8.55 (3.39)	2.53**	0.57 (0.11)	5.34**	-0.13 (0.08)	-1.68 ⁺	-0.03 (0.06)	-0.46	1.60 (1.04)	1.53	0.05 (0.14)	0.35
Gestational age	-0.07 (0.28)	-0.25	0.01 (0.01)	1.30	-0.00 (0.01)	-0.33	0.00 (0.00)	0.31	0.02 (0.07)	0.32	0.01 (0.01)	0.57
Education												
Not in school	Referent		Referent		Referent		Referent		Referent		Referent	
In school/12+ years completed	-4.50 (2.71)	-1.66 ⁺	0.07 (0.09)	0.78	0.02 (0.05)	0.36	-0.03 (0.05)	-0.66	1.77 (0.87)	2.05*	0.29 (0.11)	2.50**
Age at first intercourse	0.25 (0.47)	0.53	-0.01 (0.02)	-0.72	0.00 (0.01)	0.40	-0.01 (0.01)	-0.85	0.20 (0.15)	1.35	-0.05 (0.02)	-2.35*
Partners per year sexually active	0.37 (0.73)	0.51	-0.02 (0.02)	-0.64	-0.00 (0.02)	-0.02	0.03 (0.01)	2.42*	-0.52 (0.24)	-2.17*	0.01 (0.03)	0.45
Relationship length	0.05 (0.07)	0.73	-0.00 (0.00)	-1.01	-0.00 (0.00)	-0.88	0.00 (0.00)	0.31	-0.02 (0.02)	-1.21	-0.00 (0.00)	-1.52

*** $p \leq .01$. * $p \leq .05$. ⁺ $p \leq .10$

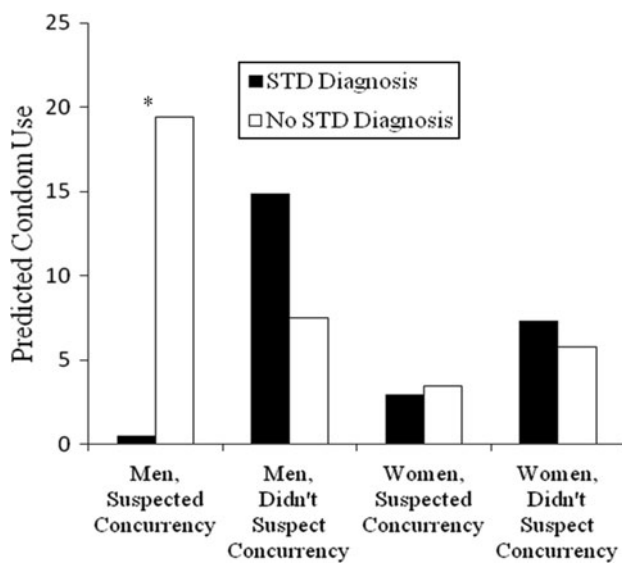


Fig. 2 Simple effects of the relationship of an actor's STD diagnosis to condom use. Significant differences are indicated with *asterisk*

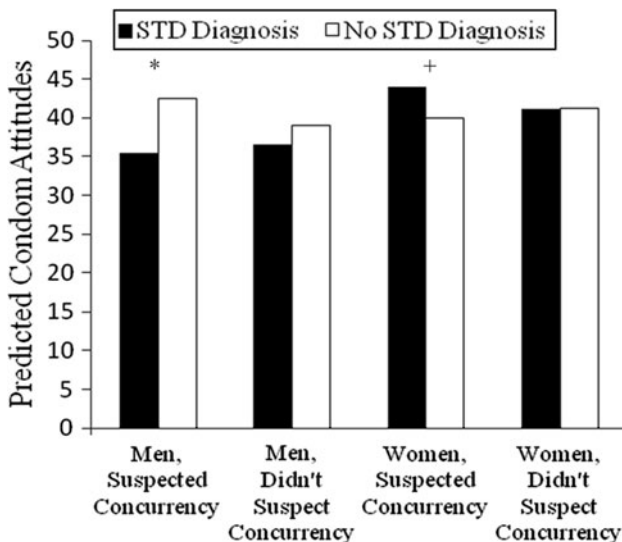


Fig. 3 Simple effects of the relationship of an actor's STD diagnosis to condom attitudes. Significant differences are indicated with *asterisk*, marginal effects with *plus symbol*

STD during the relationship was associated with less condom use in the previous month ($B = -23.18$, $t = -2.33$, $p = .02$). There was no relationship of a personal STD diagnosis to condom use among men who did not suspect concurrency ($B = 7.37$, $t = 1.18$, $p = .24$), among women who suspected partner concurrency ($B = -0.50$, $t = -0.07$, $p = .94$), or among women who did not suspect partner concurrency ($B = 1.54$, $t = 0.38$, $p = .71$). A similar pattern was obtained for the three-way interaction in the prediction of condom attitudes. For men who suspected partner concurrency, a personal STD diagnosis was associated with more negative attitudes toward condoms ($B =$

-7.12 , $t = -2.28$, $p = .02$). For women who suspected partner concurrency, a personal STD diagnosis during the relationship was associated with marginally more positive attitudes toward condoms ($B = 3.98$, $t = 1.69$, $p = .09$). Among men and women who did not suspect concurrency, there was no relationship of their own STD diagnoses to attitudes toward condoms ($B = -2.54$, $t = -1.27$, $p = .21$; $B = -.03$, $t = -0.03$, $p = .98$, respectively).

A partner's STD diagnosis also significantly interacted with gender and suspected partner concurrency in predicting condom use ($t = 2.58$, $p = .01$) and STD communication ($t = 2.28$, $p = .02$). Plots of the simple effects for each interaction are presented in Figs. 4 and 5, respectively. With respect to condom use, among men who suspected partner concurrency, a partner's STD diagnosis was associated with less condom use in the previous month ($B = -21.65$, $t = -2.32$, $p = .02$). There was no relationship of a partner's STD diagnosis during the relationship to condom use among men who did not suspect concurrency ($B = 4.87$, $t = 1.18$, $p = .24$), among women who suspected partner concurrency ($B = 3.26$, $t = 0.38$, $p = .71$), or among women who did not suspect partner concurrency ($B = -3.99$, $t = -0.69$, $p = .49$). With respect to communication with partners about STDs, a partner's STD diagnosis was marginally related to increased STD communication only among women who suspected partner concurrency ($B = 0.69$, $t = 1.85$, $p = .07$). Among women who did not suspect partner concurrency ($B = -0.35$, $t = -1.34$, $p = .18$), among men who suspected partner concurrency ($B = -0.18$, $t = -0.49$, $p = .63$), and among men who did not suspect partner concurrency ($B = 0.09$, $t = 0.50$, $p = .62$), there was no relationship of a partner's STD diagnosis during the relationship to STD communication.

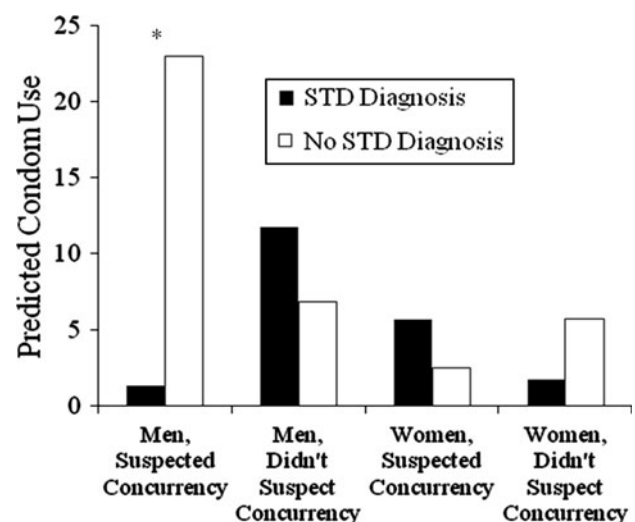


Fig. 4 Simple effects of the relationship of a partner's STD diagnosis to condom use. Significant differences are indicated with *asterisk*

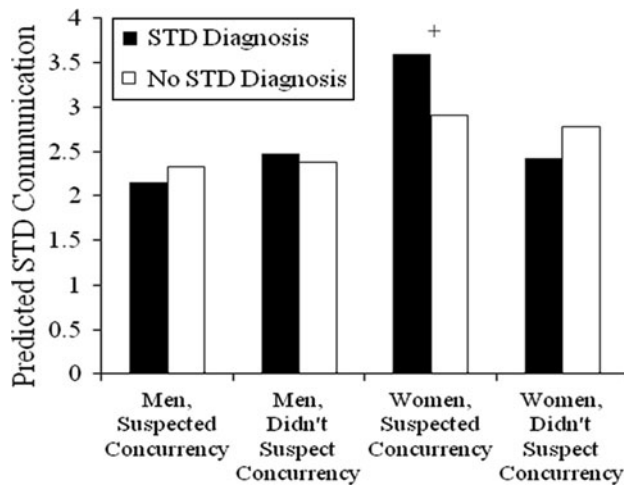


Fig. 5 Simple effects of the relationship of a partner's STD diagnosis to STD communication. Marginal differences are indicated with *plus* symbol

There were no significant gender differences in the relationships of actor or partner STD diagnosis to any of the outcomes. Significant moderation by suspected partner concurrency was obtained only for the association of a partner's STD diagnosis to condom use intentions ($t = 2.47, p = .01$). Among those who suspected partner concurrency, a partner's STD diagnosis during the relationship was associated with greater intentions to use condoms ($B = 0.69, t = 3.08, p = .01$). When individuals did not suspect partner concurrency, there was no relationship of a partner's STD diagnosis to condom use intentions ($B = 0.05, t = 0.38, p = .71$).

Among participants who had been diagnosed with an STD during the relationship ($n = 108$), number of months since the diagnosis was associated only with perceptions of susceptibility to STDs ($B = -0.01, t = -2.95, p = .01$). Perceptions of susceptibility were lower when more time had elapsed since the STD diagnosis.

We conducted a post hoc analysis to examine whether having been diagnosed with an STD during pregnancy was associated with condom use or the psychosocial outcomes. In all, 60 participants (44 women and 16 men) had been diagnosed with an STD during the pregnancy. Results were consistent with the time since diagnosis analysis. Personally being diagnosed with an STD during the pregnancy was associated with greater perceptions of susceptibility to STDs ($B = 0.22, t = 1.96, p = .05$) and marginally more condom use in the previous month ($B = 13.31, t = 1.90, p = .06$).

Discussion

The present study is unique in the examination of the association of an STD diagnosis with condom use and

psychosocial sexual outcomes in the context of an ongoing romantic relationship among young couples. These couples were expecting a baby and among some, stayed together despite having been diagnosed with an STD during the relationship. Our results suggest a complicated relationship of STD diagnosis to outcomes. How an STD diagnosis relates to these outcomes depends not only on whether an individual is personally diagnosed or his or her romantic partner is diagnosed, but also on how much time has elapsed since the diagnosis and beliefs about whether a romantic partner has had other sexual partners.

Perceptions of susceptibility were lower when more time had elapsed since the STD diagnosis. In addition, personally being diagnosed with an STD during pregnancy was associated with higher perceptions of susceptibility to STDs and a trend toward greater condom use in the previous month. These results suggest that there may be a short window of time during which an STD diagnosis is associated with susceptibility and condom use. As susceptibility is expected to serve as a motivating factor in behavior change (Janz and Becker 1984), this period of heightened susceptibility shortly following an STD diagnosis might be fruitfully capitalized on to promote sustained behavior change. Indeed, interventions have effectively reduced sexual risk among individuals recently diagnosed with an STD (Bolu et al. 2004). However, interventions directed at couples might be received more favorably if they seek to reduce sexual risk primarily by limiting extra-dyadic partners rather than improving condom use.

We observed mostly non-significant or negative relationships of a personal STD diagnosis to condom use. Previous research has yielded mixed results regarding the relationship of an STD diagnosis to condom use. Studies with follow-up periods of up to 3 months have observed greater condom use following an STD diagnosis (Crosby et al. 2004; Fortenberry et al. 2002). Studies with 6 month follow-ups have reported no relationship of STD diagnosis to condom use (Kershaw et al. 2004), and lifetime diagnosis studies have reported lower condom use (DiClemente et al. 2002; Vanable et al. 2007). The present results further support that there may be an initial improvement in condom use immediately following an STD diagnosis but that these improvements may dissipate between 3 and 6 months following the diagnosis. As our results for men who suspected partner concurrency indicate, certain individuals may eventually return to the types of behavior that initially put them at risk for contracting an STD. Due to low rates of secondary partners, we could not test for differences in condom use between primary and secondary partners. However, individuals may also respond to an STD diagnosis by increasing condom use with secondary partners but not with primary partners.

Moderation analyses indicated that higher levels of risky beliefs and behavior following a personal STD diagnosis

were observed primarily among men, particularly those who suspected that their partner had other sexual partners during the relationship. Among women who suspected partner concurrency, a personal and a partner's STD diagnosis were associated with marginally more positive attitudes toward condoms and marginally greater communication about STDs, respectively. Our results are consistent with research suggesting that men tend to engage in more risk taking (Byrnes et al. 1999) and exhibit higher levels of sexual sensation seeking (Gaither and Sellbom 2003). Thus, while an STD diagnosis coupled with suspicions of infidelity may signal a need to take protective precautions to women, young men with potentially heightened levels of sensation seeking may weight these cues less heavily. As suspecting partner concurrency is related to personally having additional sexual partners (Lenoir et al. 2006), results may also reflect that these men continued to engage in a long standing pattern of risky behavior that changed only briefly or not at all, despite contracting an STD.

While a personal STD diagnosis was generally unrelated to outcomes or was associated with higher levels of risk, a partner's STD diagnosis was associated with more positive condom intentions, condom attitudes, and STD communication. Individuals often explain negative events by making external attributions for the outcome (Miller and Ross 1975). However, sustained behavior change is more likely when individuals make intrinsic attributions, viewing themselves as responsible for behavior change (Harcikiewicz et al. 1987). The positive associations of a partner's STD diagnosis to outcomes and the concordance of STD status within couples ($r = 0.48$; 31 couples with joint STD diagnosis) suggests that couples may have discussed their STD diagnoses. Improving communication among partners following an STD diagnosis may improve important psychosocial sexual risk factors in part by mitigating the self-serving biases that are allowed to operate with a personal STD diagnosis.

Previous research has not examined associations of an STD diagnosis in the context of a romantic relationship with outcomes, and generally has not considered moderating factors. Despite our attention to these issues, this study has limitations that should be noted. First, the data are cross-sectional, limiting us to characterizing associations between STD diagnosis and the examined outcomes. Knowledge of the STD diagnosis temporally preceded completion of the measures, providing stronger causal inference. However, longitudinal studies are necessary to examine how behavior may change over time in response to an STD diagnosis, controlling for pre-diagnosis behavior. A second limitation is our reliance on self-report measures, which may be subject to socially desirable responding, measurement error, and recall bias. The use of

ACASI for data collection reduces socially desirable responding, and research suggests a high level of agreement between self-report and objective measures of having ever been diagnosed with an STD (Niccolai et al. 2005). Third, the results of our study may not generalize to non-pregnant young women. Pregnancy is associated with decreased condom use, but also decreased sexual risk (Crosby et al. 2002; Niccolai et al. 2003). Thus, non-pregnant young women who suspect partner concurrency may behave more like the men in our sample.

Implications

Our results suggest important implications for counseling following an STD diagnosis. First, given that a partner's STD diagnosis was associated with lower levels of psychosocial sexual risk, encouraging communication and safer sexual behavior in the context of a joint risk reduction counseling session with both members of a couple may prove effective in motivating longer term risk reduction. Second, our results highlight the role of beliefs about the partner in associations of an STD diagnosis with outcomes. Men who suggest a partner's infidelity as a risk factor for having acquired an STD may benefit from greater engagement in risk reduction counseling and more extensive discussion of sexual risk reduction. Finally, improving self-efficacy for coping with barriers to condom use may be the needed link to translate more positive psychosocial beliefs following an STD diagnosis into sustained safer sexual behavior. Posttest counseling following an STD diagnosis may be an ideal window of opportunity to build upon existing proclivities to engage in protective behaviors.

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