The Role of Self-efficacy and Relationship Quality in Partner Notification by Adolescents With Sexually Transmitted Infections

J. Dennis Fortenberry, MD, MS; Edward J. Brizendine, MS; Barry P. Katz, PhD; Donald P. Orr, MD

**Objective:** To evaluate the role of self-efficacy, anticipated negative consequences, and relationship quality in patient-initiated sex partner notification following treatment for sexually transmitted infections.

**Subjects:** Two hundred forty-one 13- to 20-year-old subjects (83% women; 83% African American) diagnosed with gonorrhea, chlamydia, trichomonas, or nongonococcal urethritis. Subjects were patients at a public sexually transmitted diseases clinic or primary care adolescent clinics.

**Methods:** Structured interviews at enrollment and 1 month following treatment. At enrollment, recent sexual partners were identified. Coital frequency, partner-specific sexually transmitted infection notification self-efficacy, anticipated consequences of notification, and relationship quality were measured with multi-item scales. At 1 month, subjects were asked whether partners had been notified and about the timing of notification relative to treatment.

**Results:** Subjects reported 279 partners. Of these, 61% of women’s partners and 52% of men’s partners were notified. Multiple logistic regression adjusted by generalized estimating equations showed that notification was predicted by antecedent notification self-efficacy (adjusted odds ratio, 1.16; 95% confidence interval, 1.03-1.30) and relationship quality (adjusted odds ratio, 1.17; 95% confidence interval, 1.08-1.27). Age, sex, race/ethnicity, prior sexually transmitted infection, coital frequency, and anticipated consequences were not related to partner notification.

**Conclusions:** Partner notification is increased among persons with higher levels of self-efficacy and in relationships with stronger affiliative and emotional ties. Self-efficacy and partner communication could be especially amenable to interventions to increase patient-initiated partner notification for curable sexually transmitted infections.

Arch Pediatr Adolesc Med. 2002;156:1133-1137

Several sexually transmitted infections (STIs) that are common among adolescents are cured by relatively inexpensive single-dose antibiotic regimens. In addition to curative therapy, STI treatment serves as a cue to action for sexual health education, prevention counseling, and notification of potentially infected sexual partners. Partner treatment prevents reinfections and STI transmission within a sexual network. Several strategies exist for partner notification, but patient-initiated partner notification is central to most STI control efforts. Patient-initiated partner contact is the preferred method of partner notification by adolescents. However, patient-initiated partner notification by adolescents results in notification and treatment of fewer than 40% of partners. Moreover, subsequent STI is common, due in part to additional sexual contact with an untreated partner. Providing antibiotics to the index partner for delivery to sexual partners is a promising strategy for reducing subsequent infection rates. However, this strategy still requires partner communication as an important link in the complex chain of individual behaviors required to prevent additional infections.

Factors associated with increased likelihood of partner notification include older age (older than 20 years) and relationship characteristics, with notification of steady partners more likely than casual partners. Failure to notify a partner may be due to a lack of sufficient information about the partner to allow contact subsequent to the sexual exposure. However, casual partners constitute a small proportion of adolescents’ partners, and many adolescent STIs are associated with relatively stable patterns of partnership formation. Other barriers to notification...
cation include concerns about violence or emotional rejection.\(^9\)

The importance of patient-initiated partner notification and the large number of partners left unidentified and untreated suggests the importance of a more detailed understanding of factors associated with notification. Such data could clearly inform interventions intended to improve partner notification. Additional clues about influences on partner notification may be taken from other forms of STI-prevention behaviors. For example, post-treatment STI-related behaviors such as barrier contraceptive use may be related to several factors, such as self-efficacy, partner characteristics, or fear of adverse consequences from talking about the infection.\(^9\) Self-efficacy refers to a person’s beliefs about his or her capacity to perform specific behaviors in specific situations.\(^1,3,8\) Using the example of condom use, self-efficacy is modifiable by clinical interventions, and such modification is associated with increased intention to use condoms.\(^6\) A recent study from Uganda identified self-efficacy as an important predictor of patient-initiated partner notification.\(^2\) Partner characteristics and relationship quality refer to affiliative and intimate aspects of a couple’s relationship outside of their sexual interaction.\(^3,5\) Consistent condom use is less likely when high levels of relationship quality are reported, presumably based on increased levels of trust and use of nonbarrier contraception.\(^1,6\) Fear of adverse consequences may also inhibit partner notification. Several studies show that interpersonal communication about STI or human immunodeficiency virus prevention is influenced by fear of violence or loss of an important relationship.\(^2,3,4\)

The purpose of this article is to evaluate the role of partner familiarity, notification self-efficacy, anticipated negative consequences, and relationship quality in sex partner notification within a 1-month period following STI treatment. Each measure is partner-specific in order to adjust for between-partner differences in notification. Better understanding of attitudinal and interpersonal aspects of patient-initiated partner notification by adolescents could guide interventions designed to improve partner screening and treatment.

## METHODS

Subjects were aged 14 to 20 years and were attending a metropolitan STI clinic or 1 of 3 community adolescent health clinics in Indianapolis, Ind, from March 1, 1996, through January 31, 1999. Subjects were eligible for entry if they were treated for *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Trichomonas vaginalis*, or nongonococcal urethritis. Appropriate single-dose treatment was provided for each subject, along with provision of condoms and counseling to advise sex partners of the need for testing and treatment. Each subject provided written informed consent, but the requirement for parental permission was waived. The study was approved by the institutional review board of Indiana University/Purdue University at Indianapolis.

Data were collected at 2 time points using a structured interview administered by trained research assistants. A baseline interview was conducted at study enrollment. Each of the 4 most recent partners during the previous 2 months was identified by initials or first name. Subjects responded to subsequent items for each partner. The follow-up interview was conducted approximately 1 month after the baseline interview. The initials or first name of each of the 4 partners identified during the baseline interview were confirmed.

## MEASURES

The primary outcome variable was partner notification between enrollment and the 1-month follow-up visit. Partner notification was based on a single item (obtained at the follow-up visit): “When did you tell [partner’s first name or initials] that you had a sexually transmitted disease?” The research assistant showed a calendar indicating the day of the baseline visit and the current date. This item was repeated for each partner identified at the baseline interview. Responses were coded as “did not notify partner” or as the number of days relative to the baseline visit. If the partner was notified on the same day as the baseline visit, the response was coded as zero. Positive numbers indicate partner notification in the days following the baseline visit. Responses of zero or positive numbers were recoded as “notified partner.” Some subjects indicated partner notification before the enrollment visit, likely because of contact from the clinic indicating that the index patient had an STI. Subjects giving this response were included in descriptive analyses to provide a full account of notification behaviors but were dropped from further analyses because the partner notification preceded measurement of the predictor variables.

Predictor variables include sex and race/ethnicity (white or African American) assessed by self-report at enrollment. Previous STI was assessed by responses to individual items about history of gonorrhea, chlamydia, trichomoniasis, or nongonococcal urethritis. Coital frequency was assessed by a single item assessing partner-specific coital frequency in the past 2 months. Single coital exposures were coded as “single coital exposure”; 2 or more coital exposures were coded as “multiple coital exposures.” This arbitrary coding captures the culturally and epidemiologically relevant concept of a “one-night stand” although established dyads with very low coital frequency may be misclassified. However, other measures of partner familiarity (for example, duration of the sexual relationship or characterization of a partner as “new”) produced similar results (data not shown). This variable was included to assess the possibility that notification is simply a function of sufficient partner information to allow subsequent contact.

Three multi-item scales measured baseline notification self-efficacy, anticipated consequences of notification, and relationship quality for each partner named at enrollment. Notification self-efficacy (Cronbach \(\alpha = .84\)) included 3 items asking about the ease of discussing the STI diagnosis, discussing STI treatment, and checking if the partner had been treated. The scale range was from 3 to 12, with higher scores indicating greater self-efficacy. The anticipated consequences of notification scale included 3 items (\(\alpha = .64\)) assessing the likelihood of getting hit or of breaking up the relationship because of the STI diagnosis. Higher scores mean increased perceived likelihood of consequences. The relationship quality scale was composed of 5 items (\(\alpha = .90\)) assessing the emotional, affiliative, and supportive characteristics of the interpersonal relationship of each sex-partner dyad. Individual item responses were coded as “strongly disagree,” “disagree,” “agree,” or “strongly agree.” Scale scores ranged from 5 to 20, with higher scores indicating more positive aspects of the interpersonal relationship.

## STATISTICAL ANALYSES

Summary statistics are presented as mean (SD) for continuous data and frequency (percentage) for categorical data. Baseline predictor variables were tested for differences between sexes using either the \(t\) test or the Pearson \(\chi^2\) test. Associations among
the predictor variables were tested using t tests and Pearson correlation coefficients. Bivariate association with partner notification was assessed using simple logistic regression. Multiple logistic regression was used to model the probability of partner notification by the index subject. Because subjects identified as many as 4 partners, generalized estimating equations were used to adjust for the correlations among partners within a subject.23 The statistical software SAS, version 8.0 (SAS Institute Inc, Cary, NC), was used to perform the analyses.

RESULTS

Among 241 subjects who completed both interviews (75.9% of the baseline sample), 340 sex partners were identified (Table 1). The mean age of subjects was 17.2 years, and most subjects were female and African American. About 71% reported having only 1 partner in the previous 2 months. Most subjects (73%) reported having at least 1 previous STI.

Distribution of partner notification is shown in Table 2. Fourteen partners were excluded because of data-recording errors or missing data, leaving 326 partners. An additional 47 partners were excluded from subsequent analyses because the subject reported notification of the partner before enrollment. More women than men notified partners before the baseline visit because most men were enrolled on the day of an initial clinic visit, whereas many women were enrolled at the time of treatment for positive cultures obtained at a previous clinic visit.

The final sample was 279 partners contributed by 200 subjects (161 women; 39 men). About 39% of women’s partners were not notified, compared with 49% of men’s partners. Subjects with multiple coital exposures (compared with those with a single coital exposure) reported a significantly higher mean notification self-efficacy (8.6 vs 7.6 for multiple and single coital exposures, respectively; P < .001), higher relationship quality (15.8 vs 13.9; P < .001), and lower anticipated consequences (7.0 vs 7.9; P = .008). Moderate negative correlations were noted between notification self-efficacy and anticipated consequences (r = -0.34; P = .01) and between relationship quality and anticipated consequences (r = -0.36; P = .01). Notification self-efficacy and relationship quality showed a moderate positive correlation (r = 0.35; P = .01). No sex differences were noted for coital frequency, notification self-efficacy, anticipated consequences of notification, and relationship quality (Table 3). A significantly higher proportion of notified partners (68%) had multiple coital exposures with the index subject, compared with partners who were not notified (51%).

Simple logistic regression (adjusted by generalized estimating equations) showed that multiple coital exposures, higher notification self-efficacy, and greater relationship quality were associated with significantly increased odds of partner notification. A higher level of anticipated consequences was associated with decreased likelihood of notification (Table 4).

The adjusted odds ratios and 95% confidence intervals from the multiple logistic regression are shown in Table 5. Subject age, sex, and race/ethnicity were included in the model to adjust for demographic effects, although they are not significantly associated with partner notification in the bivariate analyses. Prior STI, coital frequency, and anticipated consequences were also not significantly associated with notification. Each 1-point increase in notification self-efficacy or relationship quality is independently associated with increased likeli-
Antecedent self-efficacy for discussing STI with a partner and partner-specific relationship quality independently predict patient-initiated partner notification. Although both a single coital exposure and anticipated consequences were associated with partner notification in bivariate analyses, these relationships were attenuated in a multivariable model. This suggests that relative availability of knowledge about a partner (as assessed by multiple sexual acts with that partner) or fears about the partner’s reaction are not critical barriers to notification. Factors that could be clinically assessed, ie, self-efficacy and relationship quality, appear to enhance the likelihood of notification. Moreover, self-efficacy may be amenable to clinical intervention, especially if targeted to the contexts of specific relationships.19

Finding that self-efficacy and relationship quality predict partner notification shifts the perspective of patient-initiated partner notification from that of a public health tool to that of a health-related behavior. Such a perspective suggests that patient-initiated partner notification shares characteristics associated with other care-seeking behaviors that influence self-evaluation of symptoms, decisions to seek care, and adaptation of posttreatment prevention behaviors.26,27 Factors that influence notification thus may be appropriate targets for clinical intervention. For example, our data suggest that a theory-based intervention to improve notification self-efficacy may be important even for patients who voice no intention of notifying the partner.20 Such interventions could be especially useful if tailored to characteristics of the sexual partnership in question and incorporated with other strategies successful for reducing subsequent infection.28 Almost no research literature addresses patient-initiated partner notification among adolescents. Data from the current study are consistent with a previously observed finding that a substantial proportion of infected persons do not inform partners.29 In some instances, this is due to limited information about the partner, including key contact details such as last name or address. However, other studies show that individual characteristics, such as intention, self-efficacy, and previous notification success, are associated with patient-initiated notification.20,31 Our findings extend those of Gorbach et al29 who reported that adults’ “main” partners were more likely to be notified than other types of partners. Qualitative aspects of the interpersonal relationship, reflected by our measure of relationship quality, are important as well and may be stronger predictors of notification than the various types of partner relationships.

The potential for violence associated with partner notification is real but difficult to document.32 Relatively few adolescent participants anticipated physical violence, and none reported such an outcome. We found that anticipated consequences, including physical violence, were associated with a decreased likelihood of notification in simple but not multiple logistic regression models. It may be that our measure for anticipated consequences was insufficiently reliable or focused more on relationship consequences than on potential violence. A measure of violence more sensitive to a range of threat of violence could enhance understanding of the role of potential violence in partner notification. We note as well that violence does not need to be a common outcome of notification in order to be an important clinical issue.

Several limitations should be considered in the assessment of these data. First, the sample was drawn from urban geographic areas of high STI incidence and is relatively homogenous in terms of socioeconomic and racial/ethnic composition. The sample reasonably represents a population with high rates of STI, but generalizations to other adolescent populations should be made with caution. Second, the main outcome measure was self-reported partner notification. Reliability of self-report for this specific behavior is unknown. We did not determine whether subjects a priori considered their partners to be “contactable.” However, complete anonymity of partners, even for those with only 1 coital event, was
Many health care providers rely on patient-initiated partner notification following diagnosis of a sexually transmitted infection in an adolescent patient. Such notification addresses a public health obligation and reduces risk of reinfection by the untreated partner. No existing studies identify factors associated with partner notification by adolescent patients with sexually transmitted infections. This study found that antecedent factors of self-efficacy and relationship quality were predictors of partner notification. Clinicians may improve adolescents’ patient-initiated partner notification by counseling intended to improve self-efficacy within the context of a specific relationship.

rare in this sample. We made no attempt to document that receipt of notification resulted in appropriate partner treatment because this was not a study of the effectiveness of patient-initiated partner notification.

The information content and emotional context of communications with partners were not assessed. Ethnographic research on the communication styles, context, and context of partner notification about an STI could be extremely enlightening in this regard. Finally, other psychosocial factors such as stigma and shame were not assessed. These factors are important elements of other aspects of STI-related care that could also influence partner notification.9,26,33

Patient-initiated partner notification is an important STI prevention measure despite limited evidence of effectiveness. Our data suggest that effectiveness could be improved by interventions addressing the modifiable antecedents of notification and consideration of the relationship context in which notification occurs.

Accepted for publication June 27, 2002.

This study was supported in part by grant U19 AI31494 from the National Institute of Allergy and Infectious Diseases, Bethesda, Md. The funding organization did not participate in study design, data analysis, or manuscript preparation.

This study was presented in part at the annual meeting of the International Society for Sexually Transmitted Diseases Research, Seville, Spain, October 19, 1997.

We thank Patricia Brooks and Cathy Roberts, MA, for data collection.

Corresponding author and reprints: J. Dennis Fortenberry, MD, MS, Riley Hospital Parking Garage, Room 070, 375 N West St, Indianapolis, IN 46202 (e-mail: jfortenb @iupui.edu).

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