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Let's stay together: relationship dissolution and sexually transmitted diseases among parenting and non-parenting adolescents

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Abstract

Relationships influence sexual risk and maternal-child health. Few studies have assessed relationship dissolution and its association with sexually transmitted diseases (STD) among adolescent parents. Our study aimed to describe relationship dissolution among 295 parenting and non-parenting adolescents over an 18-month period and how it related to STD incidence. Results showed that nonparenting adolescents in a relationship with someone other than their baby's father were more likely to have a relationship dissolution over an 18-month period compared to those in a relationship with the baby's father ($OR = 1.69, P < .05$). Parenting adolescents who ended their relationship with their baby's father were 3 times more likely to get an STD over the course of the study compared to parenting adolescents who remained with their baby's father (39% vs. 13%). Comparatively, non-parenting adolescents who ended their relationship were only 1.4 times more likely to get an STD compared to non-parenting adolescents who remained with their partner (44% vs. 32%). Our results suggest that prevention programs that incorporate male partners and components that strengthen relationship skills may reduce HIV/STD risk and help adolescents adapt during times of transition such as parenthood.

Keywords

Relationship dissolution; STDs; Pregnancy; Adolescent relationships

Introduction

Over 480,000 adolescent women in the United States have a child each year (Henshaw and Finer 2003). Pregnancy during adolescence has been linked to a variety of adverse consequences for both mother and child (e.g., heightened STD risk, lower income levels, more unemployment, more relationship instability, child behavior problems; Akinbami et al. 2000). A possible contributor to negative consequences of adolescent motherhood is the father of the baby's relationship with the mother and child, which is often characterized as negative and negligible.

Becoming a parent can lead to strain and tension in romantic relationships, which may contribute to distancing and dissolution among young parents (Cox et al. 1999). Studies have found that fathers decrease their involvement with their child and the adolescent mother over the post-partum period (Cabrera et al. 2000; Coley 2001; Cutrona et al. 1998; Gee et al. 2007; Gee and Rhodes 1999, 2003; Lerman 1993). One study found 72% of adolescent females were involved with their baby's father during pregnancy, 64% by 6-months postpartum, 56% by 1-year postpartum, and approximately 50% by 18-months postpartum (Cutrona et al. 1998).

Only a few studies have looked at factors that influence relationship dissolution between adolescent mothers and their babies' fathers throughout the postpartum period (Cutrona et al. 1998). Furthermore, previous studies on relationship dissolution have been limited in their scope. First, no studies have looked at the influence of relationship dissolution and type of relationship (parenting and non-parenting) on STD incidence. Parenting adolescents who maintain a relationship with their baby's father may still be at increased risk for STDs compared to non-parenting adolescents, because parenting adolescents must consider their partner's relationship with both the baby and themselves when deciding to end a relationship. For example, one study found that relationship violence was related to relationship dissolution in non-parenting adolescents but not in parenting adolescents, suggesting that parenting adolescents may have a higher commitment to stay in romantic relationships despite negative consequences or conflict (Milan et al. 2005). This suggests that parenting adolescents may be less likely to end troubled relationships (e.g., partner is cheating, partner has an STD) because of the commitment to stay in a relationship with the father of their child.

Second, no studies have compared relationship dissolution between adolescent mothers and non-parenting adolescents. It is important for us to understand whether factors associated with relationship dissolution are different among parenting and non-parenting adolescents, because this can influence whether focused prevention efforts that tailor programs to the specific needs and adjustment patterns of adolescent parents would be warranted.

Third, few studies have looked at high-risk minority adolescents (O'Connor et al. 1999). Since consequences of adolescent motherhood (e.g., single parent, low income, STDs) are often amplified in minority populations, it is important to study predictors of relationship dissolution for high-risk minority populations in order to create prevention programs for adolescent mothers in these communities (Florsheim et al. 2003).

Finally, the focus of much relationship dissolution research has been on identifying individual factors associated with dissolution (e.g., age, psychological distress). Bronfenbrenner's Ecological Systems Theory suggests that we need to go beyond the individual and include factors located within a person's social environment (e.g., dyadic, family, and community level variables; Bronfenbrenner 1989). Ecological Systems Theory emphasizes the dynamic relationship between an individual and her social environment (DiClemente et al. 2005; Meade and Ickovics 2005). A 2002 IOM report and recent research syntheses suggested that ecologic approaches to health, STD, and pregnancy risk are particularly useful and needed (DiClemente et al. 2005; Meade and Ickovics 2005). In fact, several studies showed that the factors from higher levels in the ecological model (e.g., dyad, family, and community domains) explained more variance in risk outcomes than traditional individual-level factors alone (Mandara et al. 2003; Sipsma et al. 2010; Small and Luster 1994). As we have outlined, the focus on factors from the dyadic level (e.g., relationship and partner variables) are particularly important for understanding the role of relationship dissolution and sexual risk. Therefore, this study will focus on dyadic level influences on sexual risk to better understand the social mechanisms that put women at risk for STDs.

Few studies have looked at the combination of individual (e.g., demographic, psychological, sexual risk), relationship (e.g., duration, perceived emotional support, perceived financial support), and partner-level factors (e.g., known partner risk). Taking a wider approach to understanding relationship dissolution may help to create prevention programs during prenatal and postnatal care that seek to strengthen romantic relationships and improve maternal and child health outcomes.

This study seeks to fill the gap in the literature by prospectively comparing a cohort of high-risk minority parenting adolescent women with a cohort of non-parenting adolescent women on relationship dissolution over an 18-month period. The primary aims of this study are to: (1) identify factors associated with early (6 months after baseline) and late (18 months after baseline) relationship dissolution for parenting adolescents and non-parenting adolescents; (2) identify differential factors associated with relationship dissolution between parenting and non-parenting adolescents; and (3) assess the influence of relationship dissolution (still in relationship vs. no longer in relationship) and relationship type (parenting adolescent in a relationship with their baby's father, parenting adolescent in a relationship with another partner who is not the baby's father, non-parenting adolescent in a relationship) on sexual risk behavior and STD incidence.

Methods

Study sites

Participants were recruited through ten hospital clinics, community health care centers, and high school-based clinics in New Haven, Bridgeport, and Hartford, Connecticut. These clinics were general obstetrics and gynecology clinics that provided services such as prenatal care, birth control services, STD testing and treatment, and gynecological check-ups. All clinics predominantly served African-American and Latina communities with limited financial resources.

Procedures

Between June 1998 and March 2000, young women were approached at clinics, referred by an enrolled participant, or contacted study staff after viewing advertising material. Both pregnant and non-pregnant teens were enrolled from the same clinics using the same procedures. Eligibility criteria for all participants included being between 14 and 19 years of

age; ever having had sexual intercourse; and being nulliparous. Both pregnant and non-pregnant teens answered basic demographic questions, were screened for eligibility criteria, and then interviewed at a later date at their convenience. Because this was a longitudinal study we used an initial period as part of eligibility criteria where participants were deemed ineligible if they could not be re-contacted by a certain time after screening. Pregnant participants were interviewed in their third trimester of pregnancy ($M = 30.6$ weeks gestational age). Both pregnant and non-pregnant participants were contacted 6, 12, and 18 months after their baseline interview for a follow-up interview.

At each time point, a 90-min face-to-face, structured, clinical interview was administered by a trained member of the study team. Urine samples were collected during each study visit and tested for Chlamydia and gonorrhea using ligase chain reaction (LCR) testing (Abbott Laboratories, Chicago, IL). Participation was voluntary, confidential, and did not influence the provision of health care in any way. All procedures were approved by the Yale University Human Investigation Committee and by Institutional Review Boards at study clinics. Participants were paid \$25 for each interview.

Sample

Of the 534 eligible adolescent females, 411 agreed to participate and were interviewed (response rate 77%). The most common reasons for refusal were not being interested, and not having enough time. Adolescents who agreed to participate in the study were more likely to be African-American ($P < .05$) and younger ($P < .05$) than those who refused to participate. Participation did not vary by any other demographic characteristic or by pregnancy status. Of the 411 participants who completed baseline interviews, 318 (77%) completed the 6-month follow-up interview, 328 (80%) completed the 12-month follow-up interview, and 365 (89%) completed the 18-month interview, and 386 (94%) had data from the baseline and at least one follow-up interview. Participants with missing follow-up interviews did not differ significantly from participants with complete data on any demographic or baseline measure of interest for the study.

Participants were included in this study if they answered yes to the question of whether they were in a current romantic relationship at baseline and they completed at least the 18-month follow-up interview. Of the 411 participants, 336 (82%) indicated that they were in a current relationship at baseline. There was no significant difference between pregnant adolescents and non-pregnant adolescents on relationship status at baseline, $\chi^2(1, N = 411) = 3.24, P = .07$ (85% vs. 78%, respectively). In addition, there were no significant differences between adolescents in a relationship and adolescents not in a relationship at baseline on any of the demographic or primary study variables except that adolescents in a relationship had significantly higher self-esteem, $t(409) = 2.02, P < .05$ (measure described below), than adolescents not in a relationship. Of the 173 pregnant women in a relationship, 153 (89%) were with their baby's father and 20 (11%) were with another partner who was not their baby's father. Because the focus of this paper is on relationship dissolution during the postpartum period, the labels "parenting" and "non-parenting" adolescents will be used to differentiate the main relationship types. However, it should be noted that at baseline no participants were parents but were instead either pregnant or not pregnant.

Measures

Relationship dissolution of the baseline relationship—At each interview participants were asked if they were currently in a relationship and if so, if the relationship was the same one as their last interview. Calendars and recall questions (e.g., do you remember who you were dating in May) were used to aid recall. Participants were coded as having a relationship dissolution if they reported no longer being in the initial baseline

relationship or being in a new relationship since the baseline relationship. Whether the baseline relationship had ended was assessed at each follow-up interview. If an interview was missing, the participant's next valid interview was used to determine if the baseline relationship had ended. If the participant reported being in the same relationship as the baseline interview, they were recorded as not having a relationship dissolution for the current and missing interview. If the participant reported not being in a relationship or being in a new relationship since the baseline interview they were recorded as having a relationship dissolution for the current and missing interview. Relationship dissolution was coded in reference to the baseline relationship and was therefore cumulative (i.e., once a participant was coded as having a relationship dissolution they were coded as such for all subsequent interviews). In addition, all relationship and partner variables refer to the baseline relationship.

Relationship type—Participants were classified into 3 groups according to their pregnancy and relationship status at baseline: non-parenting in a relationship, parenting in a relationship with their baby's father, and parenting in a relationship with another partner (not their baby's father).

STD acquisition—STD acquisition was defined as any new Chlamydia or gonorrhea infection acquired over the 18-month study period. Chlamydia and gonorrhea were chosen because they are the two highest incident asymptomatic STDs among adolescent women (CDC 2008). Incident STD was captured by testing participants for any prevalent Chlamydia or gonorrhea infections and treating them at the baseline interview. Any new Chlamydia or gonorrhea infections acquired over the 18-month period were then defined as incident STDs. Incident STDs were captured through STD testing every 6 months and by reviewing medical records from participating health clinics and records from the Connecticut Department of Public Health. The use of multiple sources of STD information has been shown to improve case ascertainment of STD diagnoses (Nicolai et al. 2005).

Sexual risk behavior—In addition to STD incidence, we assessed sexual risk behavior (e.g., condom use and multiple partners). At each follow-up visit (e.g., 6-month, 12-month, and 18-month visit), adolescents were asked the number of sexual partners they had for the past 6 months, and the percentage of the times they used condoms. We created an *average percentage condom use* by averaging their reported percentage of condom use across the three follow-up assessments. Adolescents were classified as having *any multiple partnerships* if they indicated having 2 or more partners during any of the 6-month periods within the three follow-up assessments (Ickovics et al. 2003; Kershaw et al. 2003; Nicolai et al. 2003).

Individual level variables at baseline

Participants' *age* at baseline was recorded, as was their *race/ethnicity*: Black, Latina, and White/Other. *Psychological distress* was measured with the 17-item Brief Symptom Inventory (BSI; Derogatis and Melisaratos 1983). The BSI is a widely used self-report symptom inventory designed to assess psychological symptom patterns. Participants rated the frequency of symptoms on a 5 point scale ranging from 0 'not at all' to 4 'a lot'. We included three subscales: depression (e.g., hopelessness, low self-regard, suicidal ideation), anxiety (e.g., nervousness, restlessness, feelings of fear), and hostility (e.g., uncontrollable temper outbursts, frequent arguments, irritability). The somatic subscale was not used in this study because these items may be confounded by pregnancy symptoms (Milan et al. 2004a, b; van Wilgen et al. 2006). Consistent with factor analytic studies indicating unidimensionality in BSI subscales (Piersma et al. 1994), the total score are used in this study as an indicator of global severity of psychological distress (total item alpha = .90).

Self-esteem was measured with the 10-item Rosenberg Self-Esteem Scale (Rosenberg 1965). Response values ranged from 1 'strongly disagree' to 5 'strongly agree', and the average of the items was computed to create the overall scale ranging from 1 to 5. Items assessed a participant's perceived outlook on life (e.g., "In general, are you satisfied with yourself") with higher scores indicating more perceived self-esteem. Cronbach's alpha showed the scale had good internal consistency ($\alpha = .83$). *Age at sexual debut* was assessed by asking participants their age the first time they had sexual intercourse. This measure has been shown to relate to sexual risk (e.g., STDs, number of partners) in past studies (Ickovics et al. 2003; Kershaw et al. 2004; Niccolai et al. 2003). *Partners per year of sexual activity* was computed by dividing the total number of lifetime partners by the number of years sexually active, and has been previously linked to STD incidence (Ickovics et al. 2003; Kershaw et al. 2004).

Relationship level variables at baseline

Relationship duration was measured as the number of years a participant had been in a relationship with their primary partner. *Living with partner* was assessed by asking participants if they currently lived with their partner. *Frequency of partner contact* was assessed with a 1-item scale developed for this study that asked "In the past month, how frequently did you see your partner." Responses ranged from 0 'never' to 5 'every day'. *Importance of the partner on decision-making* was assessed using 4-items developed for this study that asked how important their partner was when making decisions about having sex, using protection, using drugs/alcohol, and pursuing an education. Responses ranged from 0 'not at all important' to 3 'very important'. Items were averaged to form the overall scale with high scores representing more importance of the partner on decision-making. Internal consistency was good ($\alpha = .80$). *Pressure by partner to have sex* was assessed using a single item that asked participants how much pressure they felt to have sex by their partner. Responses ranged from 0 'not at all' to 3 'very much'. The scale was heavily skewed so participants were classified as having no pressure (i.e., 0) or some pressure to have sex (i.e., 1–3). This measure has been shown to relate to underestimating sexual risk (Kershaw et al. 2003). *Partner emotional support* was measured with a 2-item scale (e.g., "How often does your partner give you emotional support," "How often can you talk with your partner about your problems"). Responses ranged from 0 'not at all' to 4 'very much'. Items were averaged to form the overall scale with high scores representing more emotional support. This measure has been used in past studies of emotional distress among adolescents (Milan et al. 2004a, b). Internal consistency was adequate ($\alpha = .71$). *Partner financial support* was assessed using a single item ("How often does your partner give you financial support"). Responses ranged from 0 'not at all' to 4 'very much', with high scores representing more financial support. This measure has been used in past studies of emotional distress among adolescents (Milan et al. 2004a, b).

Partner-level variables at baseline

Age difference between partners was assessed by subtracting the participant's age from the partner's age (Ickovics et al. 2003). *Partner risk* was assessed by classifying participants as having a risky partner if they either positively endorsed or stated they did not know that their partner: was ever an intravenous drug user; ever had sex with other men; had another sexual partner in the past 6 months; had HIV/AIDS; or ever had an STD. Individuals with partners that had any one of these risk factor were scored a 1 "partner risk" and individuals with a partner who did not have any of the above risk factors were scored a 0 "no partner risk." This variable has been previously linked to STD incidence (Ickovics et al. 2003).

Data analysis

Chi-square and ANOVA analyses were conducted to assess differences between relationship type groups on individual, relationship, and partner factors at baseline and relationship dissolution at the 6-month, 12-month, and 18-month follow-up interviews.

Logistic regression analyses were conducted to assess the influence of relationship type, individual, relationship, and partner factors on early (6-month follow-up interview) and late (18-month follow-up interview) relationship dissolution. Bivariate relationships were first assessed and all variables that significantly related to relationship dissolution at the $P < .10$ level were included in the multivariate analysis. Because relationship dissolution was a cumulative variable, we did not conduct logistic regression analyses on the 12-month follow-up because of repetition and overlap with the 6 and 18-month analyses. However, it should be noted that results for the 12-month follow-up were not markedly different than the 6 and 18-month analyses.

Possible moderating effects between relationship type and individual, relationship, and partner-level variables were assessed to identify different factors associated with relationship dissolution for parenting and non-parenting adolescents. An approach outlined by Hosmer and Lemeshow (2000) was used where interaction effects were added one-by-one to the model. Significant interactions ($P < .05$) were included in the final model and were interpreted using a strategy outlined by Jaccard (2001). All continuous variables were centered prior to creation of the interaction term (Aiken and West 1991). Finally, logistic regression analysis was used to assess the interaction of relationship dissolution and relationship type on subsequent STD acquisition during the study period.

Results

Sample description

Of the 336 participants with a baseline relationship, 295 (149 parenting and 146 non-parenting adolescents) had valid data for at least the 18-month postpartum interview. There were no differences between the 295 participants included in the study and the 41 with missing interviews on any of the demographic and study variables. The final sample consisted of 146 non-parent adolescents in a relationship at the start of the study, 131 parenting adolescents in a relationship with their baby's father, and 18 parenting adolescents in a relationship with another partner who was not their baby's father.

Twenty-two participants became pregnant at the 6- and 12-month follow-ups: 8.9% of the non-parenting adolescents; 4.6% of the parenting adolescents in a relationship with their baby's father; and 16.7% of the parenting adolescents in a relationship with another partner. Due to the small numbers and because there was no significant association between relationship type and subsequent pregnancy, $\chi^2(2, N = 295) = 4.23, P = .12$, participants who subsequently became pregnant were included in the analyses according to their baseline classification.

Comparison of relationship types on individual, relationship, and partner variables

There were significant differences between the relationship types on age, partners per year sexually active, relationship duration, living with partner, pressure to have sex, emotional support, and financial support (see Table 1). Post-hoc analyses (Tukey A tests for ANOVA and Z-tests of Adjusted Residuals for Chi-Square tests) were conducted for all significant results to assess the nature of the differences. Results showed that parenting adolescents in a relationship with their baby's father had significantly fewer partners per year of sexual activity, longer relationship duration, were more likely to live with their partner, and had

more financial support than parenting adolescents in a relationship with another partner and non-parenting adolescents in a relationship (all $P < .05$). In addition, parenting adolescents in a relationship with their baby's father had significantly less emotional support than non-parenting adolescents in a relationship and had significantly less pressure to have sex by their partners than expected given the marginal distributions (all $P < .05$). Parenting adolescents in a relationship with another partner were significantly younger than the other two groups (both $P < .05$). In addition, parenting adolescents in a relationship with another partner had significantly shorter relationship duration than non-parenting adolescents in a relationship ($P < .05$). Finally, non-parenting adolescents in a relationship had significantly more pressure to have sex than expected given the marginal distributions.

Association of relationship type and dissolution

Chi-square analyses were conducted to assess the association between relationship type and relationship dissolution (see Table 2). Relationship type significantly related to relationship dissolution at the 6-month, 12-month, and 18-month follow-up. At each time point, parenting adolescents in a relationship with their baby's father were less likely to have a relationship dissolution than non-parenting adolescents in a relationship and parenting adolescents in a relationship with another partner. Only 20% of parenting adolescents in a relationship with their baby's father had ended their relationship by the 6-month interview compared to 38% of non-parenting adolescents, and 50% of parenting adolescents in a relationship with another partner. By the 18-month interview, 48% of parenting adolescents in a relationship with their baby's father had ended their relationship compared to 61% of non-parenting adolescents, and 78% of parenting adolescents in a relationship with another partner.

Factors associated with relationship dissolution

Logistic regression analyses were conducted to assess the influence of individual, relationship, and partner level variables on relationship dissolution. Because there were only a small number of parenting adolescents with other partners, and almost all ended their relationships, parenting adolescents with other partners were not included in the logistic regression analyses. Table 3 shows the unadjusted and adjusted odds ratios for both early (6-month) and late (18-month) relationship dissolution. Table 3 reflects main effects results (i.e., results before the inclusion of interactions) to ease interpretation. The inclusion of interactions did not significantly change any of the main effects.

Factors associated with early relationship dissolution

Multivariate results showed that non-parenting adolescents, Blacks, and individuals with less financial support were more likely to have an early relationship dissolution (by the 6-month interview). In addition two significant interactions were found for the 6-month interview: relationship type by self-esteem, $\chi^2(1, N = 277) = 5.80, P < .05$, and relationship type by pressure to have sex by partner, $\chi^2(1, N = 277) = 5.41, P < .05$. To assess the nature of the interactions, simple effects for logistic regression were conducted (Jaccard 2001).

The simple effects showed that for non-parenting adolescents, less self-esteem marginally related to relationship dissolution, $OR = .59 (.34-1.02), P = .06$, whereas for parenting adolescents with their baby's father, high self-esteem related to relationship dissolution, $OR = 1.54 (.74-3.20), P = .25$. Although both of the simple effects were non-significant, the interaction was significant because the relationship was in the opposite direction for parenting and non-parenting adolescents (i.e., $OR = 1.54$ for parenting vs. $OR = .59$ for non-parenting adolescents).

The simple effect tests for the pressure to have sex interaction showed that perceived pressure to have sex by their partner was significantly related to relationship dissolution for parenting adolescents with their baby's father, $OR = 3.80 (1.49-9.67)$, $P < .01$, but did not relate to relationship dissolution for non-parenting adolescents, $OR = 1.11 (.55-2.29)$, $P = .77$. These results show that for parenting adolescents who were with their baby's father, those who felt pressure to have sex by their partners and those with high self esteem were more likely to end their relationship at the 6-month follow-up compared to non-parenting adolescents.

Factors associated with late relationship dissolution

For the 18-month interview, relationship dissolution was related to: younger age at sexual debut, shorter relationship duration, less partner contact, and less financial support. In addition, two significant interactions were found: relationship type by emotional support, $\chi^2(1, N = 277) = 4.18$, $P < .05$, and relationship type by pressure to have sex by partner, $\chi^2(1, N = 277) = 4.04$, $P < .05$. Simple effects showed that less emotional support related to relationship dissolution for parenting adolescents with their baby's father, $OR = .53 (.34-.83)$, $P < .01$, but not for non-parenting adolescents, $OR = .99 (.65-1.54)$, $P = .99$. In addition, pressure to have sex by partner significantly related to relationship dissolution for parenting adolescents with their baby's father, $OR = 2.32 (1.00-5.01)$, $P = .05$, but not for non-parenting adolescents, $OR = .64 (.32-1.29)$, $P = .22$. These results show that parenting adolescents who were with their baby's father, those who did not receive emotional support, and those who felt pressure to have sex by their partners were more likely to end their relationship by the 18-month follow-up compared to non-parenting adolescents.

Association of relationship type and dissolution on STD incidence

Next, to assess the association with relationship type and relationship dissolution on subsequent STD acquisition, logistic regression was used and the relationship type by relationship dissolution interaction term was tested. Because there were only a small number of parenting adolescents with other partners and almost all ended their relationships, parenting adolescents with other partners were not included in the analysis. However, it should be noted that 71% of parenting adolescents with other partners had a subsequent STD (69% of those with a relationship dissolution and 75% of those still in a relationship).

Women with a relationship dissolution were more likely to get an STD than women without a relationship dissolution, $OR = 2.43 (1.41, 4.16)$, $P < .001$. Non-parenting adolescents were more likely to get an STD than parenting adolescents, $OR = 1.75 (1.03, 2.94)$, $P < .05$. Furthermore, there was a significant relationship dissolution by relationship type interaction, $\chi^2(2, N = 277) = 16.91$, $P < .001$. Simple effects showed that the difference in STD incidence among parenting adolescents who dissolved their relationship with the father of the baby and those who remained with the father of the baby (39% vs. 13%) was greater compared to non-parenting adolescents who dissolved their relationship and those who remained with their partner (44% vs. 32%; see Fig. 1).

Association of relationship type and dissolution on sexual risk

Next, post-hoc analyses looking at the association with relationship type and relationship dissolution on sexual risk behavior were conducted to gain possible insight into the relationship dissolution by relationship type interaction for STDs. First, a factorial ANOVA was conducted with relationship dissolution and relationship type as independent variables and average percentage condom use as a dependent variable. Neither relationship dissolution, $F(1,272) = 0.13$, $P = .91$, nor relationship type groups, $F(1,272) = 2.27$, $P = .13$, differed on condom use. Further, the relationship type by relationship dissolution interaction was not significant, $F(1,272) = 2.62$, $P = .11$. In addition, analyses of the simple effects

showed that among women who remained with their partner, there was no difference in average percentage condom use between non-parenting adolescents in a relationship and parenting adolescents in a relationship with their baby's father ($M = 47.25$ vs. $M = 47.73$, $P = .94$). Next, logistic regression was used and the relationship type by relationship dissolution interaction term was tested for any multiple partnerships. Results showed that women with a relationship dissolution were more likely to have multiple partners than women without a relationship dissolution, $OR = 7.13$ (3.58, 14.22), $P < .001$. Non-parenting adolescents were more likely to have multiple partners than parenting adolescents, $OR = 3.25$ (1.77, 5.99), $P < .001$. There was no significant relationship dissolution by relationship type interaction, $\chi^2(2, N = 277) = 0.14$, $P = .72$, showing that the influence of a relationship dissolution on multiple partnerships did not differ by relationship type.

Discussion

Differences between parenting and non-parenting adolescents on relationship dissolution were more pronounced in the early follow-up periods (6 and 12-month follow-up) and became more comparable by the 18-month follow-up. Therefore, despite negative characterizations of male partners of adolescent mothers as absent or distant, our results suggest that most of their baby's fathers were with the adolescent mother during the prenatal and early postpartum period, and they were more likely to remain with their partner than male partners of non-parenting adolescent women. However, dissolution rates for parenting adolescents with their baby's father increased during the late postpartum period and began to approach dissolution levels of non-parenting adolescents by the 18-month follow-up visit.

One question raised by these results is whether having a baby leads to more commitment and reduced likelihood of relationship dissolution or whether those with more commitment are more likely to have a baby. Parenting adolescents had been in a relationship with their baby's father for a significantly longer duration than non-parenting adolescents. Therefore, it is possible that adolescents who became pregnant were in more committed relationships than adolescents who did not become pregnant. However, this does not entirely explain differences in dissolution rates, as non-parenting adolescents were more likely to have early relationship dissolution compared to parenting adolescents even after controlling for relationship duration. In addition, there were no differences between parenting and non-parenting adolescents on other factors that may reflect relationship commitment, such as frequency of partner contact. These results suggest that it is not entirely a case of more committed partners choosing to have a baby, but rather that having a baby may influence young couples to stay together, at least for the short term.

These results have important implications for both HIV prevention programs and programs aimed to strengthen families. It has been shown that women are motivated to make positive behavioral changes during the prenatal and postnatal period in order to have a healthy baby (e.g., better nutrition, increased exercise, reduced substance intake; Gilchrist et al. 1996). Our results suggest that young couples may also be motivated to maintain their relationship to have a happy and healthy child. Programs that seek to strengthen relationships by teaching communication skills, building coping strategies, and providing support may capitalize on this motivation and create stronger longer-lasting partnerships. In addition, the early postpartum period may be a window of opportunity to include male partners in prevention programs aimed to strengthen interpersonal relationships and reduce HIV/STD risk behavior. This is important given that relationship dissolution and STD rates among parenting adolescents do not peak until the late postpartum period (Ickovics et al. 2003). There are several intervention programs that have been shown to successfully increase father involvement and strengthen relationships during the transition to parenting for adult

populations (Cowan et al. 2007; Doherty et al. 2006; Hutchings et al. 2007). The adaptation of these programs for adolescents is needed.

Furthermore, remaining with the father of the baby had important implications on STD incidence. Parenting adolescents who ended their relationship with the fathers were 3 times more likely to get an STD over the course of the study compared to parenting adolescents who remained with the father (39% vs. 13%). Comparatively, non-parenting adolescents who ended their relationship were only 1.4 times more likely to get an STD compared to non-parenting adolescents who remained with their partner (44% vs. 32%). Among those who remained with their partner, non-parenting adolescents were 2.5 times more likely to get an STD than parenting adolescents who were with their baby's father. Therefore, parenting adolescents who remained with their baby's father had the lowest rate of STDs.

The reason for this effect is not clear. It is possible that among the couples who stayed together, the relationships between parenting adolescent women and their babies' fathers were more faithful and lower risk than relationships between non-parenting adolescents. There is some evidence to support this assertion. Among women who stayed with their partner during the entire course of the study, non-parenting adolescents were 4 times more likely to have multiple sexual partners than parenting adolescents who were in a relationship with their baby's father (16% vs. 4%). This suggests that parenting adolescents were less likely to pursue other relationships. Studies are needed that assess the sexual behavior of the male partners to fully explore this hypothesis. However, given that there were no differences in condom use between the non-parenting and parenting adolescents who remained with their partner, this suggests that STD incidence differences may be largely a function of number and type of sexual relationships. Another possibility is that parenting adolescents were more likely to end their relationship when they contracted an STD or found out their partner was cheating. It should be noted this would be counter to our hypothesis that parenting adolescents may be more tolerant of negative behavior of their partners because of the commitment to staying in a relationship with the father of their child.

Our result suggests that much can be gained by fostering strong and positive relationships between parenting adolescents and their baby's fathers in terms of reduced HIV and STD risk. Parenting adolescents who remained with their baby's father were less likely to get an STD than *both* parenting adolescents who ended their relationship with their baby's father *and* non-parenting adolescents who remained with their partner. This should not be interpreted as an endorsement for staying with the baby's father regardless of the quality or nature of the relationship. Instead, it suggests that programs should be developed to help create strong and positive relationships among young parents to help develop and maintain low sexual risk behavior. Furthermore, it also suggests STD prevention programs are needed for young non-parenting couples because relationships do not seem as protective for this group. Helping young couples assess risk within the context of a relationship, and improve relationship communication and attachments may facilitate risk reduction (Kershaw et al. 2005, 2007).

Another important finding from this study was that adolescents who have a partner during pregnancy who is not the baby's father (i.e., parenting adolescents with another partner) are a group that are at high-risk for STDs regardless of whether they end their relationship (approximately 70% contracted an STD over the course of the study). This group of adolescent women has not received much attention in the literature, but they appear in need of additional prevention efforts. In addition to the high rates of STD, they had the highest rates of relationship dissolution. Three out of four of the relationships had ended by the 18-month follow-up. Furthermore, they had several baseline differences that suggest high risk including the highest rate of partners per year of sexual activity, the most pressure to have

sex, and the least financial support. These results suggest that integrated and comprehensive prevention programs (e.g., HIV/STD prevention, mental health services, social services) are needed for this high-risk group of adolescents.

This study had several limitations. First, we used a clinic-based sample of sexually active adolescent females who may have different sexual practices and risks than a random sample of adolescent females. Another limitation is our use of relatively simple measures of several variables including social support (e.g., 1 and 2 item measures) and financial support (e.g., did not include perceived adequacy of financial support or actual amount of money received). Although we did find significant relationships, these measures may influence internal and construct validity. Furthermore, the reliance on self-report measures for adolescents who may not be as truthful or self-reflective as adults, may introduce error into analyses. Another limitation is that we did not assess the reason for dissolution and who initiated it. Understanding how the relationship ended will help to design effective programs that serve to strengthen relationships among young parents. Another limitation is that we did not assess overall relationship functioning in addition to relationship dissolution. Future studies should incorporate other measures of relationship functioning such as relationship satisfaction, support, and communication. Another limitation is that once a relationship ended we coded it as dissolved and did not assess possible dynamic relationships (e.g., getting back together, breaking up again). Future studies should explore the dynamic nature of these relationships and how it relates to risk. Finally, we did not ask the exact date of dissolution so we could not assess overall length of relationship or conduct more sophisticated data analysis such as survival analysis.

Despite these limitations, there were numerous strengths in this prospective, longitudinal cohort study. Participants were drawn from ten different health clinics in three cities. They were ethnically/racially diverse, and represented a group at high risk for future adverse reproductive health outcomes including (repeat) pregnancy and sexually transmitted diseases. Few studies that have looked at relationship dissolution have compared a cohort of parenting and non-parenting adolescents. In addition, few have looked at a combination of individual, relationship, and partner variables and none have looked at the effect of relationship dissolution on STD acquisition.

Conclusions

Given the negative consequences of relationship dissolution (Cutrona et al. 1998; Ickovics et al. 2003), it is important to consider the relationship context of both non-parenting and parenting adolescents. We are not suggesting that all relationships can and should survive; however, programs could be created that develop skills to help couples adjust during stressful transitions such as parenting. Our results suggest that incorporating components that strengthen relationship skills in prevention programs may help to reduce HIV/STD risk and emotional and behavioral problems in women and children. Certainly, male partners should be included in the prevention process. Given the importance of relationships on maternal, child, and reproductive health outcomes, both members of the relationship need to be included in order to achieve long-lasting health.

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Fig. 1.
STD acquisition by relationship type and relationship dissolution

Table 1

Differences on individual, relationship, and partner level characteristics by relationship group

	Non-parenting in a relationship <i>N</i> = 146	Parenting in a relationship with their baby's father <i>N</i> = 131	Parenting in a relationship with another partner <i>N</i> = 18	Statistical test
<i>Individual</i>				
Age in years <i>M</i> (SD)	17.22 (1.38)	17.43 (1.47)	16.52 (1.54)	$F = 3.43^*$
Race <i>N</i> (%)				
Black	64 (44)	55 (42)	12 (66)	$\chi^2 = 6.19$
Latina	59 (40)	60 (46)	3 (17)	
White	23 (16)	16 (12)	3 (17)	
Psychological distress	19.73 (13.43)	18.11 (13.07)	19.89 (14.91)	$F = 0.54$
Self-esteem	4.02 (.62)	4.10 (.62)	3.99 (.46)	$F = 0.59$
Age in years at sexual debut	14.54 (1.41)	14.67 (1.80)	13.94 (2.26)	$F = 1.57$
Partners per year of sexual activity	1.59 (1.05)	1.33 (.99)	2.31 (1.54)	$F = 7.52^{***}$
<i>Relationship</i>				
Relationship duration	1.17 (1.16)	1.72 (1.09)	0.55 (.78)	$F = 13.75^{***}$
Living with partner <i>N</i> (%)	11 (8)	41 (31)	1 (2)	$\chi^2 = 28.46$
Frequency of partner contact	4.20 (1.23)	4.18 (1.45)	3.67 (1.53)	$F = 1.29$
Importance of partner on decision-making	2.25 (.79)	2.13 (.89)	2.14 (.81)	$F = 0.81$
Pressure to have sex by partner <i>N</i> (%)	50 (34)	28 (21)	8 (44)	$\chi^2 = 7.71^*$
Emotional support by partner	3.46 (.79)	3.21 (.87)	3.42 (.93)	$F = 3.16^*$
Financial support by Partner	2.60 (1.29)	3.07 (1.29)	2.22 (1.52)	$F = 6.31^{**}$
<i>Partner</i>				
Age difference in years	2.25 (3.09)	2.62 (3.09)	2.71 (3.08)	$F = 0.58$
Partner risk <i>N</i> (%)	58 (40)	47 (31)	11 (61)	$\chi^2 = 4.24$

* $P < .05$,** $P < .01$,*** $P < .001$;

Cells contain means and standard deviations in parentheses unless otherwise noted; Pressure to have sex by partner and known partner risk were yes/no variables; All F -tests had $df = 2, 294$; and all Chi-square tests had $df = 2$ and $N = 295$ except for Race which had $df = 4$ and $N = 295$; All variables are coded such that higher scores indicate more of the construct (e.g., more partner per year; more frequency of partner contact, more pressure to have sex by partner)

Table 2

Relationship dissolution by relationship type over time

Time	Non-parenting in a relationship (<i>N</i> = 146) (%)	Parenting in a relationship with their baby's father (<i>N</i> = 131) (%)	Parenting in a relationship with another partner (<i>N</i> = 18) (%)	Chi square
6 month follow up	38.4	19.8	50.0	14.39***
12 month follow up	52.1	33.6	72.2	15.21***
18 month follow up	61.0	48.1	77.8	8.25*

* $P < .05$,** $P < .01$,*** $P < .001$;all tests had $df = 2$ and $N = 295$

Table 3

Unadjusted odds ratios for relationship dissolution at 6-month and 18-month follow up

Predictor	Relationship dissolution at 6-month follow up		Relationship dissolution at 18-month follow up	
	Unadjusted odds ratio	Adjusted odds ratio	Unadjusted odds ratio	Adjusted odds ratio
<i>Relationship type</i>				
Non-parenting	2.51 (1.46–4.33)***	2.04 (1.08–3.85)*	1.69 (1.05–2.72)*	1.25 (.73–2.17)
Parenting in a relationship with baby's father	Referent	Referent	Referent	Referent
<i>Individual</i>				
Age in years	.83 (.69–.99)*	.82 (.64–1.06)	.91 (.77–1.08)	–
Race				–
Black	Referent	Referent	Referent	
Latina	.48 (.27–.85)*	.44 (.23–.85)*	.82 (.49–1.36)	
White	.76 (.35–1.65)	.98 (.40–2.42)	.76 (.37–1.58)	
Psychological distress	1.01 (.99–1.03)	–	1.05 (.94–1.11)	–
Self-esteem	.81 (.54–1.24)	–	.88 (.60–1.29)	–
Age in years at sexual debut	.78 (.66–.92)**	.85 (.69–1.05)	.82 (.70–.96)**	.84 (.71–.99)*
Partners per year sexual activity	1.31 (1.03–1.65)**	.99 (.72–1.35)	1.27 (.98–1.63) [†]	1.06 (.79–1.41)
<i>Relationship</i>				
Relationship duration	.67 (.51–.88)**	.76 (.57–1.02)	.71 (.57–.88)***	.74 (.58–.94)**
Living with partner	.24 (.10–.57)***	1.08 (.37–3.20)	.29 (.15–.55)***	1.01 (.31–3.22)
Frequency of partner contact	.76 (.64–.92)**	.84 (.68–1.04)	.72 (.59–.89)**	.80 (.65–.99)*
Importance of partner on decisions	1.04 (.76–1.41)	–	1.07 (.81–1.42)	–
Pressure to have sex by partner	1.91 (1.10–3.33)*	.65 (.35–1.23)	1.17 (.69–1.99)	–
Emotional support by partner	.72 (.53–.96)*	.80 (.55–1.16)	.77 (.57–1.03) [†]	.92 (.65–1.30)
Financial support by partner	.68 (.56–.83)***	.75 (.59–.76)*	.69 (.54–.86)***	.75 (.60–.90)**
<i>Partner</i>				
Age difference in years	1.01 (.93–1.11)	–	1.03 (.95–1.11)	–
Partner sexual risk	1.98 (1.14–3.42)**	.71 (.38–1.35)	2.06 (1.24–3.40)**	.71 (.41–1.26)

* $P < .05$,** $P < .01$,*** $P < .001$,[†] $P < .10$;

All variables are coded such that higher scores indicate more of the construct (e.g., more partner per year; more frequency of partner contact, more pressure to have sex by partner)