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Describing relationship characteristics and postpartum HIV risk among adolescent, young adult and adult women in South Africa

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Abstract

Purpose—To characterize sexual relationships in pregnancy and HIV risk behavior in the first 14 weeks postpartum among adolescents (< 18), young adult (18–24), and adult women (>24).

Methods—We use bivariate and multivariate statistical tests to describe differences across adolescents (n=29), young adult (n=263) and adult women (n=207).

Results—In pregnancy, adolescents were in significantly less stable relationships and had higher-risk partners than young adult or adult women. At 14 weeks postpartum, adolescents were significantly more likely to think their partners were having concurrent relationships since delivery and were likely to have lower relationship power than adult women. Furthermore, young adults were significantly more likely to return to sex and report physical intimate partner violence in the first 14 weeks postpartum than adult women.

Conclusion—Adolescent mothers may benefit from interventions that promote empowerment and the development of healthy relationship skills. Young adult women may benefit from interventions to delay early postpartum engagement in unprotected sex and prevent IPV exposure. All women, regardless of age group, may benefit from interventions that increase access to pre-exposure prophylaxis (PrEP) and partner's access to HIV testing during the perinatal period.

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Keywords

adolescent mothers; HIV prevention; HIV risk; postpartum; pregnancy; South Africa; sexual behavior; intimate partner violence

Introduction

Postpartum HIV incidence rates among women in southern Africa are high, at 2.9 per 100 person-years [1]. The relative risk of HIV infection per sex act is four times greater for postpartum women compared to non-postpartum women [2], and young women are at highest risk of postpartum HIV infection [3]. However, our understanding of the behavioral factors contributing to postpartum HIV risk for young women, and particularly adolescents, is limited.

A woman's age at pregnancy may affect her relationship dynamics, which may increase her postpartum HIV risk (including unsafe sex and also intimate partner violence (IPV)). Researchers frequently exclude adolescent minors (<18), or control for age in their analysis, without theorizing why age might matter. That is, age is often treated as a biological reality, with little attention to how historical and cultural processes make age itself a meaningful marker of power [4]. In South Africa, pregnancy among adolescents is often stigmatized [5], which can lead to isolation from families and peers. In turn, adolescent mothers may rely more on their partners for emotional and material support and subsequently have greater postpartum HIV risk than older women.

To develop tailored HIV prevention strategies, we need to know whether women's relationship characteristics and HIV risk postpartum vary by age. Our aim is to characterize relationships in pregnancy and HIV risk postpartum among adolescent (< 18 years), young adult (18–24 years), and adult women (>24 years).

Methods

Parent study designs and procedures

Data were obtained from two complementary datasets: the South African Antenatal Posttest Support Study (SAHAPS) [6], an RCT conducted at a public antenatal clinic (ANC) in a Durban township with 1,480 adult women (>18); and a supplementary study, in which we concurrently recruited 40 adolescents (<18; median=16.4; IQR: 15.8, 17.1) to pilot an adaptation of SAHAPS. For SAHAPS, women were recruited and enrolled at their first ANC visit and eligible to participate if they were pregnant, >18, had been with their partner for at least six months and if they had never tested for HIV or tested negative at least 3 months prior to enrollment. Adolescents were eligible to participate in the pilot if they met the same criteria as SAHAPS, if they were <18, and if their parent/guardian provided informed consent. Participants in both studies completed a baseline assessment after providing written informed consent (or assent) and before receiving clinical services (including HIV testing). SAHAPS participants were randomized to receive enhanced or standard of care counselling; all adolescents participated in the pilot. Participants (1183 from SAHAPS and 39 from the

pilot) completed a follow up assessment at 14 weeks postpartum. The IRBs at the University of North Carolina and the University of KwaZulu Natal approved the research.

Measures

HIV risk (at 14 weeks postpartum)—Measures were based on participant self-report Sexually active was measured dichotomously as sexually active since delivery (yes/no) Partner concurrency was measured as perceived partner has other sexual partners since delivery versus does not or does not know. Physical intimate partner violence (IPV) was assessed using 6 items on physical violence from the World Health Organization Modified Conflict Tactic Scale [7] Items were summed and a binary variable was created ($\alpha=0.72$). Relationship power was assessed using 23 items from the Sexual Relationship and Power Scale [8]. Each item was scored on a Likert scale and items were summed (range:5.0, 67.5). Higher scores indicate greater relationship power ($\alpha=0.85$).

Sociodemographic, relationship and pregnancy characteristics (at baseline)—

We conducted a principal component analyses using 20 items of working household facilities to create an index for socioeconomic status (SES) [9,10]; Education is reported dichotomously (non-high school graduate or high school graduate). We also measured a number of relationship characteristics, including: participant's self-reported marital status (defined as currently married versus not); living together (defined as currently living with partner versus not); length of relationship; partner age; partner HIV testing, and relationship age-disparity, which we report continuously (by subtracting a woman's age from her partner's age) and categorically (partner is 5 years older; partner is 10 years older), gestational age at first ANC visit, pregnancy intention (measured dichotomously as intended or unintended pregnancy) and first-time parenthood (yes/no).

Analysis

For this analysis, we excluded women who tested HIV-positive at baseline ($n=571$), and we excluded HIV- women who did not complete the 14 weeks assessment ($n=219$). In addition, we excluded participants with missing data on key covariates, for a total analytic sample of 499 participants. We used logistic regression to examine baseline predictors of drop-out at the 14-week visit; there were no differences in drop-out by sexual risk and/or violence at baseline.

We first examined whether relationships and HIV risk differed across the three age groups using Fisher's exact tests for categorical variables and one-way ANOVA for continuous variables. For significant results, we used post-hoc analyses (pair-wised Fisher's exact and Tukey's tests, respectively) to examine which age groups differed. For pair-wise Fisher's exact test, we used a Bonferroni-adjusted alpha (0.017) instead of 0.05 to control for family-wise error rates [11]. To calculate the Bonferroni-adjusted alpha, our desired alpha, 0.05, was divided by 3 (the number of tests completed: adolescent vs young adults, young adult vs adult and adolescent vs adult mothers). Second, we used multivariate logistic and linear regression to examine associations between age group and HIV risk (with adult mothers as the reference category), controlling for key covariates.

Results

Adolescents' relationship characteristics in pregnancy differed from young adult and adult women (Table 1). Specifically, they were significantly less likely to be married, were in newer relationships, were less likely to report their pregnancy was intended and were more likely to be pregnant for the first time. Adolescents were also significantly less likely to think that their partner had tested for HIV compared to young adult or adult women.

Adolescents' HIV risk at 14 weeks postpartum also differed from adult women in bivariate and multivariate analyses (Table 2). Adolescents were less likely to resume sex, though these differences were attenuated after adjustment. Adolescents were more likely to think their partners were concurrent and more likely to have low relationship power (AOR: 4.71, 95% CI: 1.60–13.87; ARR: -46.29, 95% CI: -48.86, -43.76), respectively). There were no differences between adolescent and adult women in levels of physical IPV.

Young adult's HIV risk postpartum also differed from adult women in bivariate and multivariate analyses (Table 2). Young adults were more likely to engage in sex and to report physical IPV since delivery (AOR: 1.75, 95% CI: 1.06, 2.89 and AOR: 2.53, 95% CI: 1.13, 5.68, respectively). Young adult and adult women did not differ in perceived partner concurrency or relationship power.

Discussion

Our findings suggest that adolescent, young adult and adult women's relationships and postpartum HIV risk differ in meaningful ways. Adolescents, in particular, were in less stable, more power-inequitable relationships with high-risk partners (i.e., unknown HIV status and suspected concurrency) with whom they had not planned their first pregnancy. While young adult and adult women's relationships were more stable, young adult's early return to sex and high IPV in the immediate postpartum period suggests they also face challenges negotiating relationship dynamics after childbirth.

To our knowledge, few studies in settings with generalized HIV epidemics have described postpartum HIV risk with a particular focus on adolescent and young mothers. In one study with women in Western Kenya, older women were more likely to engage in sex in the first 36 weeks postpartum than younger women [12]; however, the authors examined the impact of age in 10-year increments, which limits comparison of return to sex by different women in different developmental phases. In another study with women in Cape Town, there was no association between age and postpartum sex [13]; however, adolescent minors were excluded from the study, which precludes the ability to fully examine age as a correlate of risk. Finally, neither study examined other important domains of postpartum HIV risk, such as perceived partner concurrency, relationship power or physical IPV.

Our conclusions are limited by our small sample of adolescents, the fact that the assessment of HIV risk was restricted to the early postpartum period and the fact that we did not measure transactional sex (i.e. exchange of sex for material or financial benefits), which may be particularly relevant for adolescent mothers given the economic strain of having a new child. A longer follow up period with additional measures and a larger sample of adolescent

minors is needed. There is a paucity of research on adolescent minors in South Africa given legal challenges with enrolling them in research studies [14]; failure to include them in research hampers effective program and policy development.

Nonetheless, observed differences in relationships and HIV risk across age groups suggest that tailored combination intervention strategies may be needed. At the individual level, adolescent mothers and their partners may benefit from individual and/or couples' psychosocial interventions during the transition to parenthood that build relationship skills (and in particular, improve communication about HIV risk and address sociocultural norms contributing to acceptability of concurrency and power imbalances). HIV risk reduction counseling that focuses on safe sex or delayed return to sex in the early postpartum period may be appropriate for young adults but may be less relevant for adolescents. Young adults may also benefit from interventions that mitigate IPV or provide support or referrals during the perinatal period [15]. Finally, structural interventions are needed to increase access to male partner HIV testing and to increase access to PrEP for all women during and after pregnancy, regardless of age.

Implications and Contribution statement

Adolescents were in less stable relationships with high-risk partners, whereas young adult women were in more stable relationships but had early return to sex and high physical IPV postpartum. Tailored individual-level interventions combined with structural-level interventions that increase partner HIV testing and access to PrEP are critical to reduce postpartum HIV acquisition.

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Table 1

Sociodemographic, relationship and pregnancy characteristics and HIV risk at 14 weeks postpartum (N=499)

	Overall n=499	Aged 14–17 years n=29	Aged 18–24 years n=263	Aged 25–45 years n=207	p-value ^a
	Mean (SD), n(%) ^b	Mean (SD), n(%) ^b	Mean (SD), n(%) ^b	Mean (SD), n(%) ^b	
Sociodemographic characteristics					
Marticulated	269 (53.9%)	2 (6.9%)	166 (63.1%)	101 (48.8%)	****
SES					*
High SES	116 (23.3%)	8 (27.6%)	72 (27.4%)	36 (17.4%)	
Middle SES	205 (41.1%)	15 (51.7%)	110 (41.8%)	80 (38.7%)	
Low SES	178 (25.7%)	6 (20.7%)	81 (30.8%)	91 (44.0%)	
Relationship characteristics					
Married	42 (8.4%)	0 (0.0%)	9 (3.4%)	33 (15.9%)	****
Living with partner	130 (26.1%)	2 (6.9%)	35 (13.3%)	93 (44.9%)	****
Relationship length (in years)	4.9 (4.43)	1.8 (1.18)	3.4 (2.38)	7.2 (5.55)	****
Primary partner's age	28.4 (6.90)	19.8 (2.48)	25.3 (4.21)	33.7 (6.40)	****
Age disparity (in years)	3.6 (3.84)	3.4 (2.57)	3.8 (3.59)	3.3 (4.25)	
Age Disparity 5 years	139 (27.9%)	9 (31.0%)	76 (28.9%)	52 (25.1%)	
Age Disparity 10 years	29 (5.8%)	0 (0.0%)	10 (3.8%)	19 (9.2%)	*
Partner HIV testing					**
Has tested before	186 (37.3%)	6 (20.7%)	98 (37.3%)	82 (39.6%)	
Has not tested	216 (43.3%)	10 (34.5%)	110 (41.8%)	96 (46.4%)	
Not sure	97 (19.4%)	13 (44.8%)	55 (20.9%)	29 (14.0%)	
Pregnancy characteristics					
Gestational age at first antenatal visit (in weeks)	24.5 (5.92)	25.7 (4.47)	23.9 (5.92)	25.0 (6.02)	^
Intended pregnancy	112 (22.4%)	0 (0.0%)	40 (15.2%)	72 (34.8%)	****
Had a previous pregnancy	299 (59.9%)	1 (3.5%)	116 (44.1%)	182 (87.9%)	****
First time mother	216 (43.3%)	28 (96.6%)	160 (60.8%)	28 (13.5%)	****
HIV risk at 14 weeks postpartum					
Sexually active since delivery	285 (57.1%)	6 (20.7%)	156 (59.3%)	123 (59.4%)	**
Perceived partner concurrency	104 (20.8%)	13 (44.8%)	50 (19.0%)	41 (19.8%)	**
Physical IPV since delivery	68 (13.6%)	5 (17.2%)	46 (17.5%)	17 (8.2%)	*

	Overall n=499	Aged 14–17 years n=29	Aged 18–24 years n=263	Aged 25–45 years n=207	p-value ^a
	Mean (SD), n(%) ^b	Mean (SD), n(%) ^b	Mean (SD), n(%) ^b	Mean (SD), n(%) ^b	
Relationship power	52.1 (12.19)	8.0 (1.52)	54.9 (5.42)	54.8 (5.57)	****

^

p<0.10

* p<0.05

** p<0.01

*** p<0.001

**** p<0.0001

**** p<0.0001

^a For categorical variables, p-values are from χ^2 tests. For continuous variables, p-values are from one-way ANOVA.

^b Percentages present are column percentages

Table 2
Bivariate and multivariate associations between baseline characteristics and HIV risk outcomes at 14 weeks postpartum

	Sexually active since delivery		Perceived partner concurrency		Physical IPV since delivery		Relationship Power	
	Model 1 (bivariate)	Model 2 ^a (multivariate)	Model 1 (bivariate)	Model 2 ^a (multivariate)	Model 1 (bivariate)	Model 2 ^a (multivariate)	Model 1 (bivariate)	Model 2 ^a (multivariate)
	OR (95% CI) ^b	OR (95% CI) ^b	OR (95% CI) ^b	OR (95% CI) ^b	OR (95% CI) ^b	OR (95% CI) ^b	β (95% CI) ^c	β (95% CI) ^c
Age (adult mother=referent group)								
Adolescent mother (< 18 years)	0.18** (0.07,0.46)	0.50 (0.16,1.52)	3.29** (1.47,7.38)	4.71** (1.60,13.87)	2.33 (0.79,6.88)	1.33 (0.32,5.57)	-46.66** (-48.74,-44.58)	-46.29*** (-48.86,-43.72)
Young mother (18–24 years)	0.99 (0.69, 1.44)	1.75* (1.06,2.89)	0.95 (0.60,1.51)	1.00 (0.55,1.80)	2.37** (1.31, 4.27)	2.53* (1.13,5.68)	0.24 (-0.74,1.21)	0.08 (-1.18,1.35)
Living with partner	1.83** (1.20,2.79)	1.54 [^] (0.93,2.55)	0.66 (0.39,1.13)	0.64 (0.34,1.19)	0.63 (0.33,1.20)	0.75 (0.34,1.67)	2.88* (0.45,5.31)	0.36 (-0.92,1.63)
Primary partner's age	1.06** (1.03,1.09)	1.06*** (1.02,1.11)	0.99 (0.96,1.03)	1.03 (0.99,1.08)	0.95* (0.91, 0.99)	0.97 (0.91,1.03)	0.47*** (0.32,0.62)	-0.04** (-0.14,0.07)
Relationship length (in years)	1.04 [^] (1.00,1.09)	0.99 (0.94,1.04)	0.97 (0.92,1.02)	0.98 (0.91,1.04)	1.01 (0.95, 1.07)	1.10* (1.01,1.19)	0.44** (0.20,0.68)	0.04 (-0.09,0.18)

[^] p<0.10
* p<0.05
** p<0.01
*** p<0.001

^a Controlled for gestational age at first antenatal visit, SES, matriculation and study arm

^b Estimated using logistic regression

^c Estimated using linear regression