Childbearing Motivations and Desires, Fertility Beliefs, and Contraceptive Use among Urban African-American Adolescents and Young Adults with STI Histories

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Published online: 18 July 2018
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Abstract This study explored the influence of STI history on childbearing motivations, fertility beliefs,

Key Messages

- Effective fertility-related education and behavior change counseling for African-American adolescents during STI diagnosis may be underutilized.
- Younger age and positive pregnancy history was the greatest predictor of condom and contraception use in this sample.
- Current STI and pregnancy-prevention initiatives should be tailored to incorporate secondary prevention approaches that consider the influence of pregnancy history on prevention behaviors.

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current childbearing desires, and contraception use among urban African-American adolescents and young adults (AYA). Secondary data were from the Neighborhood Influences on Adolescent and Young Adult Health (NIAAH) study, conducted from 2004 to 2007. Sample included 517 AYA ages 15–24 years (male: $n = 199$, female: $n = 318$). Linear and logistic regression models examined gender differences in childbearing motivations (CBM) and desires, fertility beliefs, condom, and contraception use. Logistic regression models were constructed to examine age, pregnancy history, and STI fertility knowledge as potential confounders. AYA men (3.29) and AYA women (3.23) had similar CBM mean scores. AYA women had more positive CBM and used condoms less. Condom use was not associated with CBM among AYA men ($OR = 0.71$, $p = 0.069$). Low beliefs about fertility ($OR = 0.52$, $p = 0.003$) and prior pregnancy ($OR = 5.27$, $p = 0.002$) were associated with current childbearing desires among AYA women. AYA men's low fertility beliefs were only associated with current childbearing desires ($OR = 0.56$, $p = 0.044$). AYA men reported more contraception use (67.46 vs. 55.04%), especially with no partner pregnancy history ($OR = 0.26$, $p = 0.017$). Younger men (15 to 18 years old) reported more contraception or condom use compared to older AYA men (19–25 years old) ($OR = 0.40$, $p = 0.016$). Young men reporting a partner's prior pregnancy used fewer condoms or contraception ($OR = 0.23$, $p = 0.028$). STI history did not influence CBM in this sample of urban youth. Prior pregnancy experiences and chronological age, however, were important milestones shaping proximal motivations and desires to bear

children, beliefs about fertility, and contraception behaviors.

Keywords Adolescents · Condoms · Contraception · Hormonal contraception · Sexually transmitted diseases

Introduction

Despite similar patterns of sexual activity, socioeconomically disadvantaged African-American adolescents and young adults (AYA) have disproportionately higher rates of bacterial STIs and unintended pregnancies than other racial/ethnic groups [1, 2]. Consequences of persistent exposure to STIs may increase potential for acquiring life-threatening sexually related morbidities such as HIV [3] and complications such as pelvic inflammatory disease, pelvic pain, tubal infertility, and ectopic pregnancy [4]. Overwhelming evidence suggests these disparities occur due to social determinants such as racially and economically segregated sexual networks, patterns of incarceration, and systemic discrimination practices [5–7]. For example, historical injustices denying African-American options to choose neighborhoods in which they live have resulted in endemic poverty and a limited sex partner pool. Thus, there is a greater chance of selecting a partner who has a STI [8]. These social inequities also influence attitudes towards fertility, patterns for childbearing, and sexual behaviors because creating long-term stable relationships is often unrealistic, yet sexual activity and having a child are motivational life goals [9–12].

Impaired fertility can be a consequence of repeated STIs, presenting an even greater burden on African-American AYA. Future fertility is a priority for socioeconomically disadvantaged African-American AYA across gender [12]. While childbearing during adolescence is suboptimal, there are often tensions around timing and spacing of childbearing among AYA due to social and cultural circumstances in economically challenged communities [13]. Concerns about fertility are prevalent among AYA and might predict engagement in unprotected intercourse [14] and/or low contraception uptake [15].

While studies illustrate youth with STI diagnoses are less likely to use contraception [16, 17], less is known about how exposure to STIs, chronological age, pregnancy history, and individual perceptions about fertility might influence childbearing motivations and

contraceptive decisions [18]. Factors including STI history, worry about pregnancy, partner communication, and partner age influence differential contraception use patterns between younger and older adolescents [19, 20]. In fact, younger men and women were less likely to use contraception or to use them sporadically, especially when sexual activity was initiated during early adolescence [20].

African-American AYA with limited economic circumstances often have more children and have desires for motherhood at earlier ages [13]. Having a history of prior pregnancy can influence contraception use. Motherhood during late adolescence and economic disadvantage predicts favorable views about teen motherhood and influences sexual and contraception behaviors [19]. Compared to non-parenting teens, adolescent parents often engage in high-risk sexual behavior and are less likely to use effective contraception; therefore, rapid repeat pregnancies are often high among young mothers, increasing risks for STI exposure [21, 22].

While many studies focus on young women's individual level motivations for childbearing and expressed desires to protect their fertility [12, 23, 24], few researchers explore the impact of fertility beliefs on contraception practices among male AYA. Furthermore, there is inadequate evidence that suggests young men's CBM, intentions, and desires affect sexual health behaviors. An STI diagnosis represents a unique opportunity to explore sexual and reproductive health behaviors given that both unintended consequences can occur as a result of the same sexual behaviors.

Study objectives were to examine associations of STI diagnosis with positive childbearing motivations, beliefs about fertility, and most recent condom and contraception use patterns of African-American AYA. We used Miller's Traits-Desires-Intentions-Behaviors (TDIB) framework to guide our analysis [25] to account for varying dimensions of influence (motivations, desires, and intentions) on childbearing behaviors.

Traits-Desires-Intentions-Behaviors Framework

Motivational traits can include feelings or attitudes towards childbearing, desires about the number and timing of children, and intentions often shaped by contextual influences such as economic status, perceived desires of partners, parental expectations, and social norms [26, 27]. The TDIB framework [25] identifies a continuum towards contraception behavior that includes

a first step when traits or motivations are formed, leading to a second step of developing desires. Those desires for childbearing then shape the third step, pregnancy intentions, which determines the fourth step, individual contraception behaviors [25]. We examined the influence of prior STI diagnosis on three of the framework's constructs: motivational traits and associated factors (CBM, STI fertility knowledge, and fertility beliefs), desires (current child wantedness), and behaviors (condom and contraception use).

Material and Methods

All study activities were approved by the Johns Hopkins School of Medicine Institutional Review Board (IRB#00081267). We utilized data from the Neighborhood Influences on Adolescent and Adult Health (NIAAH) study, a large household study of AYA living in high *Neisseria gonorrhoeae* (GC)-prevalent neighborhoods in Baltimore, Maryland, a large urban mid-Atlantic city. NIAAH methods have been described in the literature [28], but will be briefly reviewed in this section.

Study Setting

Data from the NIAAH study were collected using a household survey conducted between April 2004 and April 2007. Baltimore City has a predominantly African-American population (64%) [29] and carries the highest burden of STI incidence in the state of Maryland. In 2015, more than 18,000 cases of *Chlamydia* were reported in Maryland among young people between the ages of 15 to 24 [30]. Almost one-third of those cases occurred in Baltimore City [30]. English-speaking, sexually active individuals aged 15–24 years who lived in 65 randomly sampled GC-prevalent census block groups were recruited for the study.

Sampling Strategy

The two-phase sampling scheme employed in this study was designed to examine factors related to acquisition of STIs. In the first phase, census block groups were selected for recruitment if their epidemiological profile revealed a prevalence of GC greater than the 25th percentile and were selected based on a stratified, systematic probability proportional to size; 65 block groups were identified. In the second phase, nonlinear

optimization was used to determine eligible households within the 65 selected block groups [28].

Sample size of the NIAAH study was 575 ($n = 353$ AYA women; $n = 222$ AYA men). Less than 10% of the NIAAH study sample were identified as racial/ethnic groups other than African-American. We limited our analysis to African-American youth participating in the survey ($N = 517$) because they experience disproportionate rates of STIs and unintended pregnancies. Participants in our analysis completed at least 75% of the items on the CBM scale.

Measures

Self-reported data were collected using an audio computer-assisted self-interview (ACASI). STI history was assessed by combining responses to four items: “Have you ever had or been told that you had: (1) PID (women only), (2) Gonorrhea, (3) *Chlamydia*, or (4) any other sexually transmitted disease such as syphilis, trichomonas, herpes, or warts?” A “Yes” response to any of the four items was coded as having an STI history.

To assess the participants' motivational traits and associated factors, we measured CBM, STI fertility knowledge, and fertility beliefs. CBM was assessed using the two subscales of the CBM questionnaire (positive childbearing motivations (PCM) and negative childbearing motivations (NCM) developed by Miller [31]. These scales were adapted for use among a population of youth and demonstrated high internal consistency (Cronbach's alphas 0.94 for positive motivations and 0.85 for negative motivations) [16]. Respondents rated gender-specific items using a 4-point Likert scale of desirability or undesirability (ranging from “Very positive” to “Not positive” or “Very negative” to “Not negative”). PCM was assessed among women using 30 items (e.g., “feeling a baby move inside of me”). NCM were assessed among women using 22 items (e.g., “having a baby who affects my health”). PCM was assessed among men using 27 items (e.g., “giving my partner/girlfriend the satisfaction of motherhood”). NCM were assessed among men using 19 items (e.g., “burdening our family finances with a child”). Scores for PCM and NCM were created by averaging the responses, with higher scores denoting more positive or more negative motivations [32].

To assess STI fertility knowledge, we combined the responses to the following four items addressing whether the participant thought certain health issues can cause

fertility problems: “Having sexually transmitted diseases or STDs in the past,” “Having a Chlamydia infection in the past,” “Having gonorrhea infection in the past,” and “Having Pelvic Inflammatory Disease (PID) in the past.” Possible responses included “Yes,” “No,” or “Don’t Know.” Response scale scores for STI Fertility Knowledge ranged from zero to four. A score of zero indicated low STI fertility knowledge; four indicated high STI fertility knowledge. Cronbach’s alpha for the STI fertility knowledge items was 0.89.

Fertility beliefs were developed using the following scale that was also piloted with the revised CBM measures [16]. For this analysis, we combined the responses to three gender-appropriate items: “I have wondered about my fertility (ability to get [someone] pregnant),” “I wonder if I will be able to get [someone] pregnant in the future,” and “I think it will be hard for me to get [someone] pregnant when I want to.” Respondents rated the items using a 4-point Likert scale ranging from “Strongly Agree” to “Strongly Disagree.” Response scores ranged from one to four. Cronbach’s alpha was 0.80 for women and 0.75 for men. A score of one indicated low fertility beliefs; a score of four indicated high fertility beliefs. To assess the second TDIB construct, childbearing desires, we assessed current desire for a baby using a single-item: “Do you want to have a(nother) baby now?” Respondents could answer either “yes” or “no.”

The final construct in the TDIB framework, (condom and contraception) behaviors, was assessed using the question, “What type of contraception or HIV/STD protection methods did you use the last time you had sex? Did you use (choose all that apply): a) Condoms, b) Pills, c) Depo-Provera, d) Norplant, e) Withdrawal, f) Rhythm, g) Other, or h) “Nothing.” If participants responded with answer choices a through d or g, their response was coded as “Yes” to contraception. Answer responses of e, f, or h were coded as “No” contraception use.

Pregnancy history was assessed using a gender-specific single-item: “How many times have you been pregnant?” (AYA women) or “How many times have you gotten someone pregnant?” (AYA men). Any response of one or greater was coded as having a pregnancy history.

Statistical Analyses

All analyses and summary statistics were adjusted by sampling weights associated with census block groups

from the original survey [28]. Gender differences were tested with chi-square and *t* tests. Bivariate linear or logistic regression was used to test the relationship between STI history and childbearing motivation, desire to have a baby now, contraception use at last sex, and condom use at last sex. Linear or logistic multivariable regression was used to analyze other predictors of childbearing motivation, desire to have a baby now, contraception use at last sex, and condom use at last sex. All variables were entered into the model simultaneously. Variables in all models included age, pregnancy history, STI fertility knowledge, and fertility beliefs. Separate analyses were conducted for men and women. All analyses were conducted in STATA version 14.1 [33].

Results

The total sample size was 517: 199 males (38.5%) and 318 females (61.5%). The ages of male and female participants were significantly different. The mean age of women was 19 (0.15) whereas the mean age of men was 18 (0.20). Female AYA were more likely than male AYA participants to report a history of STI and pregnancy (OR = 2.69; 95% CI 1.50–4.54). Of the 397 participants who had sex, male participants were more likely than female participants to use condoms (OR = 1.30; 95% CI 1.04–1.63) and contraception of any kind at last sex (OR = 1.37; 95% CI 1.00–1.85). Men had significantly higher fertility knowledge scores than women (mean 1.69 vs. 1.49, $p < 0.001$). There were no differences by gender regarding their desire to have a baby now, CBM or fertility beliefs. Table 1 summarizes the characteristics of the sample by gender.

Motivational Traits: Relationship between STI and CBM

STI history was not significantly related to CBM for female ($b = 0.040$, $p = 0.678$) or male ($b = -0.007$, $p = 0.959$) participants. STI history was also not significantly associated with current desire for a baby for female (OR = 1.63, $p = 0.206$) or male (OR = 0.60, $p = 0.418$) participants.

Factors Related to CBM

Table 2 summarizes the results of the linear and logistic multivariable regression analyses predicting CBM and

Table 1 Sample characteristics by gender adjusted by sampling weights

	Men	Women	χ^2	<i>p/t</i> test
Age			8.23	0.006
15–18 years old	53.07%	39.23%		
19–24 years old	46.93%	60.77%		
Mean (SE)	18.349 (0.20)	19.38 (0.15)		
STI history			15.02	< 0.001
Yes	15.98%	33.80%		
No	84.02%	66.20%		
Pregnancies			20.81	< 0.001
Yes	32.16%	55.23%		
No	67.84%	44.77%		
Desires a baby now			2.53	0.118
Yes	14.60%	21.10%		
No	85.40%	78.90%		
Condom use at last sex			5.71	0.021
Yes	67.46%	55.04%		
No	32.54%	44.96%		
Contraception use at last sex			3.03	0.088
Yes	85.66%	78.12%		
No	14.34%	21.88%		
Fertility knowledge			– 4.15	< 0.001
Mean (SE)	1.69 (0.036)	1.49 (0.038)		
Fertility beliefs			– 0.57	0.571
Mean (SE)	2.74 (0.077)	2.71 (0.077)		
CBM			0.66	0.422
Mean (SE)	3.29 (0.064)	3.23 (0.042)		

current desires for a baby. CBM was not related to age, pregnancy history, or fertility beliefs. STI fertility knowledge was not related to CBM for women, but for men, higher fertility knowledge was associated with higher CBM ($b = -0.33$, $p = 0.019$). For females, wanting to have a baby now was significantly related to pregnancy history, with those who had a prior pregnancy being more likely to want a baby now ($OR = 4.47$, $p = 0.007$). Fertility beliefs were also significant for female participants. Those who were less confident that they could have a baby were more likely to desire a baby now ($b = 0.52$, $p = 0.007$). For men, desiring to have a baby now was significantly related to fertility beliefs ($b = 0.57$, $p = 0.033$) but not related to a history of pregnancy. Like the females, males with less confidence that they could have a baby were more likely to desire a baby now. Age and STI fertility knowledge were not significantly associated with current desire for baby for males or females.

Relationship between CBM and Contraception Use

CBM was not significantly related to contraception use at last sex for male or female participants; however, for females, it was associated with reports of male partner condom use ($OR = 0.67$, $p = 0.034$). Female participants with higher CBM were less likely to use condoms. CBM was not significantly associated with contraception use or condom use for males. Current desire for a baby was not significantly related to contraception use or condom use for male or female participants.

Other Factors Related to Contraception Use

Table 3 summarizes the results of the multivariable logistic regression analyses for contraception and condom use. For female participants, younger age ($OR = 0.33$, $p = 0.026$) and higher confidence that they could

Table 2 Linear regression results for childbearing motivation and logistic regression results predicting desire to have a baby now for women and men

A: Linear regression predicting childbearing motivations				
	Women		Men	
	<i>b</i> (SE)	<i>p</i> value	<i>b</i> (SE)	<i>p</i> value
Age	0.002 (0.086)	0.979	0.21 (0.17)	0.226
Pregnancy history	0.149 (0.107)	0.171	0.22 (0.16)	0.164
Fertility beliefs	0.19 (0.072)	0.794	−0.07 (0.10)	0.522
Fertility knowledge	0.009 (0.115)	0.940	−0.33 (0.14)	0.019
B: Logistic regression predicting desire to have a baby now				
	aOR (95% CI)	<i>p</i> value	aOR (95% CI)	<i>p</i> value
Age	1.45 (0.45, 4.68)	0.528	0.67 (0.27, 1.67)	0.371
Pregnancy history	4.47 (1.54, 12.96)	0.007	2.86 (0.89, 9.16)	0.076
Fertility beliefs	0.52 (0.32, 0.83)	0.007	0.57 (0.34, 0.95)	0.033
Fertility knowledge	0.62 (0.26, 14)	0.273	0.58 (0.23, 1.50)	0.257

have a baby ($OR = 1.68$, $p = 0.018$) were associated with using contraception at last sex. Conversely, none of the factors were significantly associated with condom use. In addition, in our model, CBM was no longer significantly associated with condom use when controlling for age, STI history, pregnancy history, fertility history, or fertility beliefs. Males with a history of a pregnancy were less likely to use contraception at last sex ($OR = 0.19$, $p = 0.011$). Younger age ($OR = 0.46$, $p = 0.050$) and no history of pregnancy ($OR = 0.28$, $p = 0.032$) were associated with use of condoms among males.

History of STI, fertility history and fertility beliefs were not associated with condom use for males.

Discussion

We examined relationships between STI history, CBM, and contraception use among a sample of socioeconomically disadvantaged African-American AYA. We found no significant association between STI history and CBM. Our findings aligned with previous research,

Table 3 Logistic regression results for contraception and condom use for women and men

	Women		Men	
	aOR (95% CI)	<i>p</i> value	aOR (95% CI)	<i>p</i> value
Contraception use at last sex				
STI history	1.45 (0.51, 4.16)	0.480	0.74 (0.17, 3.20)	0.677
Chronological age	0.33 (0.13, 0.87)	0.026	0.820 (0.24, 2.80)	0.745
Pregnancy history	0.62	0.349	0.19 (0.05, 0.67)	0.011
Fertility beliefs	1.68 (1.10, 2.58)	0.018	0.84 (0.38, 1.88)	0.672
Fertility knowledge	1.54 (0.62, 3.84)	0.342	1.99 (0.34, 11.63)	0.434
Condom use at last sex				
STI history	1.50 (0.60, 3.75)	0.377	0.77 (0.22, 2.691)	0.672
Chronological age	0.62 (0.26, 1.47)	0.274	0.46 (0.21, 1.00)	0.050
Pregnancy history	0.73 (0.34, 1.58)	0.416	0.28 (0.09, 0.89)	0.032
Fertility beliefs	1.14 (0.778, 1.68)	0.504	0.83 (0.52, 1.35)	0.453
Fertility knowledge	2.07 (0.94, 4.58)	0.071	1.44 (0.54, 3.82)	0.459
CBM	0.69	0.065	Not in model	

demonstrating that wanting to have a baby was associated with stronger individual beliefs about fertility [14, 34]. In this sample, fertility beliefs shaped the desires of both males and females who wanted to have a baby at the time of the survey. For female participants, these desires were also associated with a history of pregnancy, supporting a long line of inquiry and data demonstrating the propensity for repeat pregnancies within 24 months of first birth during adolescence [21, 22, 35, 36] and STI acquisition [17, 37].

While the majority of research to date has focused on the contraception experiences of young women [38], a growing body of literature demonstrates that young men have strong feelings about pregnancy and its prevention [39, 40]. We disaggregated responses by gender because we did not assume young men and women shared the same reproductive experiences [41]. Gender affects how AYA relate to each other including in relation to individual choices and beliefs about reproduction. Despite agreement on the value of future fertility and childbearing desires [12], there may be gender-based differences in attitudes and behaviors about CBM and contraception decision-making processes [42].

Similar to previous research, we found that AYA women with higher CBM were less likely to report that their partner used a condom during their most recent sexual experience [16]. However, CBM was not a significant influencing factor for AYA male condom or contraception use behavior. Our findings, however, contradict previous research regarding gender-based differences in STI-related fertility knowledge. In this study, AYA males demonstrated greater knowledge than AYA women about the link between specific STIs and fertility problems. This is an interesting finding given that AYA women interact more often with reproductive health providers that might expose them to health information [12].

Our results highlight other differences along gender lines related to factors influencing contraception use. Although not significant for young men, among young women, a younger age was significantly associated with recent use of contraception [19, 43, 44]; however, a previous experience with pregnancy significantly influenced male reports of contraception use.

Pregnancy history was not a significant factor for female reports of contraception use, although among AYA men, a younger age and pregnancy history significantly influenced reports of condom use. These gender differences in factors that affect condom and

contraception use have implications for further understanding differential decision-making processes and contextualized frameworks that shape priorities for contraception management. An understanding of how gendered beliefs may influence decisions and subsequent behavior is an important finding from this study that may provide insights about gender-based prevention strategies promoting dual modes of protection.

Despite recommendations by experts that individuals at high risk of STIs should approach pregnancy and STI prevention by simultaneously using both a highly effective hormonal contraception and condom with each act of intercourse [45], the prevalence of this dual method use is low among low-income AYA and those in established sexual partnerships [46]. While use of the dual methods does not differ significantly by gender, some studies have found racial/ethnic differences. Though the literature is inconsistent, African-Americans generally demonstrate higher dual use patterns than Whites or Hispanics [47–49]. Those reporting dual use are often using them inconsistently and incorrectly [50, 51]. This is particularly important among African-American youth living in disadvantaged communities who have demonstrated sexual initiation as well as desires for childbearing at earlier ages [52, 53]. These behaviors can, thus, increase risk for STI acquisition and unintended pregnancies, often decreasing future chances for economic and social opportunities [54]. Our findings provide greater context in which to understand motivations for childbearing and pregnancy-prevention strategies among low-income African-American AYA.

Limitations

This within-group analysis of African-American AYA provided an opportunity to better understand CBM due to well-documented health disparities facing this group. However, findings must be interpreted in the context of several general limitations. First, this was a secondary data analysis; therefore, we were unable to design the questionnaire to fit our specific research questions. Specifically, one of the items used to determine STI history included herpes and warts that do not have demonstrated effects on fecundity. Second, items measuring CBM were at the end of the survey; therefore, many participants did not complete them. This may reflect participant fatigue given the length of the NIAAH survey.

Third, we used the TDIB Framework to guide the study's analyses. The construct "desires" is debated in the literature and often conflated within research, which is a limitation to our findings [55, 56]. Fourth, the item measuring contraception use was not exhaustive, excluding the contraception patch, NuvaRing, and IUD. Also the contraceptive device, Norplant, is not currently available for pregnancy prevention. Thus, the age of some of these data is limited in scope. Finally, participant self-reports of behaviors are subject to recall bias and social desirability.

Acknowledgments This work was supported by the National Institutes of Health [grant number 3R011NE013507-04S1].

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