



Original article

College Graduation Reduces Vulnerability to STIs/HIV among African-American Young Adult Women

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ABSTRACT

African-American women are disproportionately affected by sexually transmitted infections (STIs), including HIV. The Theory of Gender and Power (TGP) posits that socioeconomic exposures, including educational attainment, place women at increased risk for STIs/HIV. This study examined the association between educational attainment and vulnerability to STIs/HIV, as well as potential TGP-driven mediators of this association, among African-American women. Baseline data were assessed from an STI/HIV prevention intervention for African-American women ($n = 848$) aged 18 to 29 recruited from three Kaiser Permanente Centers in Atlanta, Georgia. Data collection included a survey of demographic, psychosocial, and behavioral measures and self-collected, laboratory-confirmed vaginal swabs for STIs (trichomoniasis, chlamydia, gonorrhea, and human papillomavirus). Multiple regression analyses and multivariate mediation analyses were used to examine the association between educational attainment with a laboratory-confirmed STI and potential TGP mediators. Controlling for age and receipt of public assistance, the odds of an STI diagnosis were 73% lower among participants with a college degree or greater compared with participants who had not completed high school. There were also significant associations between educational attainment and multiple TGP mediators from the sexual division of power and the structure of cathexis. TGP constructs did not mediate the association between educational attainment and laboratory-confirmed STI. The current study suggests that graduating from college may lead to a beneficial reduction in vulnerability to STIs/HIV among African-American women. Findings from this study support expanding structural-level interventions, emphasizing both high school and college graduation, as a means of reducing vulnerability to STIs/HIV among African-American women.

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Introduction

Young African-American women experience a disproportionate burden of HIV and other sexually transmitted infections (STIs) such as chlamydia, trichomoniasis, gonorrhea, and human papillomavirus (HPV; Centers for Disease Control and Prevention

[CDC], 2009a, 2009b, 2010; Weinstock, Berman, & Cates Jr, 2004). The disproportionate rates of STIs among African-American women aged 15 to 24 could potentially lead to devastating consequences. First, gonorrhea and chlamydia are common causes of pelvic inflammatory disease, which can lead to abdominal pain, infertility, and increased risk for ectopic pregnancy (CDC, 2007a, 2007b). HPV infection can lead to numerous sequelae, including almost all cervical cancers; other anal and genital cancers, and related precursors; anal and genital warts; and recurrent respiratory papillomatosis (Markowitz et al., 2007). Furthermore, the presence of STIs can increase the risk of contracting HIV, and cause HIV-infected people to transmit HIV more easily to others (CDC, 2007a, 2007b; Risser et al., 2005).

Because of the burden of STIs and their sequelae, it is imperative to hone our understanding of risk and protective

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factors among young African-American women. The Theory of Gender and Power (TGP) provides a framework for understanding the socioeconomic, interpersonal, and individual exposures that place women at increased risk for acquiring HIV and other STIs (Wingood & DiClemente, 2002). The TGP posits that the three main structures impacting women's HIV risk are the sexual division of labor, the sexual division of power, and the structure of cathexis (social norms and affective attachments; Wingood & DiClemente, 2002). The sexual division of labor includes socioeconomic exposures, such as poverty level, employment status, and educational attainment (Wingood & DiClemente, 2002). Research has shown that several socioeconomic exposures, including living in poverty (CDC, 2009a), being unemployed or underemployed (Wingood & DiClemente, 1998), having limited or no health insurance (Diaz, Chu, & Buehler, 1994), working in a high-demand/low-control environment (such as sex work; Shannon et al., 2009), and being an ethnic minority (CDC, 2009a), may lead to increased STI/HIV risk. Another noteworthy socioeconomic exposure is having less than a high school-level education (Anderson, Brackbill, & Mosher, 1996; Upchurch et al., 1992).

There are several mechanisms through which educational attainment may impact vulnerability to STIs/HIV. First, it is possible that educational attainment, as a structural determinant in the sexual division of labor, impacts more proximal determinants within the sexual division of power, such as condom communication skills, lower self-efficacy to avoid STIs/HIV, and limited perceived control over condom use (Wingood & DiClemente, 2002). Previous research among African-American adolescent females has shown that economic risk (comprising receipt of public assistance, employment, and educational attainment) was a distal predictor of condom communication (DePadilla, Windle, Wingood, Cooper, & DiClemente, 2011). Furthermore, people with increased levels of education report a greater sense of control over their lives and health (Freudenberg & Ruglis, 2007; Ross & Wu, 1995). This may provide a sense of empowerment for women, allowing them to feel more comfortable negotiating condom use and STI testing with their partners, as well as increased relationship control (Crosby et al., 2007; Wingood & DiClemente, 2002).

Educational attainment may also impact more proximal determinants within the structure of cathexis, such as limited knowledge of HIV prevention, having sex with older partners, and having sex with multiple partners (Wingood & DiClemente, 2002). Research has shown that increased education provides increased financial earnings and improved access to health information and the tools to acquire health-related resources, which may increase STI-related knowledge (Freudenberg & Ruglis, 2007; Ross & Wu, 1995). Women with increased educational attainment may also have more tools to avoid partner-related risks, such as having older partners and multiple sex partners, which may be associated with STI infection (DiClemente et al., 2002; Seth et al., 2011; Seth, Wingood, Robinson, & DiClemente, 2009).

In the United States, research has shown that adolescents who are not enrolled in high school are more likely to initiate sexual activity earlier (Mauldon & Luker, 1996), engage in unprotected vaginal and anal sex (Crosby et al., 2007), and become pregnant (Manlove, 1998). Several studies have examined the association between educational attainment and HIV risk in developing countries (Birdthistle et al., 2009; Hargreaves et al., 2008; Hargreaves & Howe, 2010; Kayeyi, Sandoy, & Fylkesnes, 2009; Pettifor et al., 2008), and a few studies have

examined the association between educational attainment and HIV risk among certain high-risk subpopulations in the United States, including injection drug users (Hasnain, Levy, Mensah, & Sinacore, 2007), and incarcerated women (Paasche-Orlow, Clarke, Hebert, Ray, & Stein, 2005). Together, these studies have provided mixed evidence for the effects of educational attainment on HIV risk. Some studies have demonstrated a protective association between educational attainment and HIV risk (Birdthistle et al., 2009; Pettifor et al., 2008), although some studies have reported higher levels of educational attainment may place women at increased risk for HIV (Hargreaves et al., 2008).

A recent study from the CDC demonstrated increased HIV prevalence among heterosexual men and women aged 18 to 50 in urban areas with less than a high school education compared with high school graduates and people with more than a high school education (CDC, 2011). However, beyond the high school level, little is known about the magnitude and mechanisms of the association between educational attainment and vulnerability to STIs/HIV among young adult African-American women.

This study examined the association between educational attainment and vulnerability to STIs/HIV, and potential mediating mechanisms of this association, among a sample of young, African-American women. Specifically, this study examined the association between educational attainment (from the TGP's sexual division of labor) and laboratory-confirmed STI, as well as the association between educational attainment and theoretical mediators of HIV risk from the TGP's sexual division of power and the structure of cathexis. Additionally, potential mediation mechanisms of the association between educational attainment and laboratory-confirmed STI were tested using the TGP framework.

Methods

Study Participants

The current study used baseline data from an STI/HIV prevention intervention for African-American women aged 18 to 29 ($n = 848$). All data were collected before intervention implementation. Participants were recruited from three Kaiser Permanente (KP) centers in Atlanta, Georgia. To receive services at KP, all participants had to be insured with KP, either through their employers or their families. The 4,488 African-American women receiving services from the three KP centers were sent invitation letters to participate in the study and were screened for eligibility via telephone. Eligibility criteria included being 1) African-American, 2) female, 3) aged 18–29, 4) unmarried, 5) sexually active in the past 6 months, and 6) providing written informed consent. Participants received \$50.00 as compensation for their time. Overall, 3,509 women were ineligible for the study because they did not meet eligibility criteria (55.9%), were not available to participate (13.2%), or were not interested in participating (9.1%). All 979 (21.8%) women remaining were invited to participate in the study, and 848 (86.6%) enrolled. This study was approved by the Institutional Review Board at the researchers' university.

Data Collection

Data collection included both a survey and laboratory-confirmed STI diagnosis. For the survey, participants completed a 40-minute audio computer-assisted survey interview to assess

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