Utilizing a Life Course Approach to Examine HIV Risk for Black Adolescent Girls and Young Adult Women in the United States: A Systematic Review of Recent Literature

Tamara Taggart, PhD, MPH[1]; Norweeta G. Milburn, PhD[2]; Kate Nyhan, MLS[3]; Tiarney D. Ritchwood, PhD[4]

Objective: Black female youth have been disproportionately burdened by the HIV epidemic. Emerging literature suggests that individual and social-structural factors may uniquely increase HIV risk within this population during key developmental periods, namely adolescence (ages 10-17 years) and emerging adulthood (ages 18-25 years). Few studies, however, have compared drivers of risk within and between these key developmental periods. Therefore, we conducted a systematic review of recent literature to characterize and identify important gaps in our understanding of the individual, psychosocial, and social-structural determinants of HIV risk among Black adolescent girls and emerging adult women.

Design: Using a replicable strategy, we searched electronic databases for articles and abstracts published between October 1, 2017 and September 30, 2019 in which the primary focus was on HIV prevention among Black adolescent girls and emerging adults in the United States.

Results: In total, 21 studies met the inclusion criteria. Most of the studies on Black adolescent girls assessed family functioning, parental monitoring, and parent-adolescent communication as determinants of HIV-related behaviors. However, equivalent studies were lacking for Black emerging adult women. Moreover, few studies assessed neighborhood characteristics, social networks, or other community-level factors as determinants of HIV-related behaviors, which are known drivers of HIV disparities.

Conclusions: Our findings highlighted several gaps in the literature, including failure to recognize the ethnic and cultural differences among Black women that may contribute to behavioral differences within this population and insufficient acknowledgment of the role of HIV protective factors (eg, resilience and community assets). Implications and future directions are discussed. *Ethn Dis*. 2020;30(2):277-286; doi:10.18865/ed.30.2.277

Keywords: HIV; Adolescents and Emerging Adults; Women; HIV Prevention; African American

[1] Department of Prevention and Community Health, George Washington University, Washington, DC; Department of Social and Behavioral Sciences, Yale School of Public Health, New Haven, CT
[2] Department of Psychiatry and Biobehavioral Sciences, Semel Institute for Neuroscience and Human Behavior, University of California, Los Angeles, CA
[3] Yale School of Public Health; Harvey Cushing/John Hay Whitney Medical Library, Department of Environmental Health Sciences, Yale University, New Haven, CT
[4] Department of Family Medicine and Community Health, Duke University School of Medicine, Durham, NC

Address correspondence to Tamara Taggart, PhD, MPH; George Washington University, 950 New Hampshire Ave, NW Suite 300, Washington, DC 20052; ttaggart@gwu.edu

Introduction

Black American youth are disproportionately burdened by the effects of the HIV epidemic, as they comprise 56% of all people living with HIV between the ages of 13 and 24 years.[1] Concerns are particularly high for Black adolescent girls and women, who, in 2017, accounted for 26% of new HIV cases among all Blacks and 59% of new HIV cases among all women.[2] Moreover, they were infected at rates that were three to four times higher than their White and Latina counterparts.[2] Nearly 90% of all new HIV infections among Black women are from heterosexual sexual activity.[3]

The cause of the disparate rates of HIV among Black women, compared with women of other racial and ethnic backgrounds, is multifactorial and is often attributed to the cumulative effects of individual, psychosocial, and distinct social-structural factors (eg, neighborhood quality, social network factors, and healthcare access).[4,5] Extant evidence shows that engagement in high risk behaviors, including risky sexual behaviors and substance use during adolescence (the developmental period encompassing ages 10-17 years) and emerging adulthood (the developmental period encompassing ages 18-25 years) is directly associated with poor sexual health outcomes

in later adulthood.[6] A life course approach,[7,8] which acknowledges that engagement in HIV-related behaviors is gendered, influenced by context, and varies by developmental stage, is greatly needed to curb the HIV epidemic in the United States.

Adolescence is a transitional life stage characterized by rapid biological, neurodevelopmental, and psychological growth.[9] It is also the stage during which many adolescents initiate romantic relationships and have their first consensual sexual experiences.[10] While sexual interest and exploration are normative within this age group, sexual initiation during adolescence is associated with a number of negative sexual health behaviors and outcomes including inconsistent condom use, multiple sexual partners, unintended pregnancy, and sexually transmitted infections (STIs).[11,12] Compared with White and Latina adolescent girls, previous research suggests that Black adolescent girls are more likely to initiate sexual activity at an earlier age, which heightens their vulnerability to HIV.[13] To facilitate the success of HIV prevention programs for Black adolescent girls, we must identify and target socio-cognitive processes that govern engagement in sexual risk and foster the internalization of values and beliefs that support safer sexual practices. These processes call for greater emphasis on both the antecedents and consequents of sexual practices and behaviors.[14]

The primary aim of this systematic review of recent literature is to characterize the individual, psychosocial, and social-structural determinants of HIV-related behaviors among Black adolescent girls and emerging adult women

A large proportion of the literature on HIV-related behaviors among Black women focuses on distinct developmental stages (ie, adolescence or adulthood); however, an increasing amount of research acknowledges the uniqueness of emerging adulthood and its association with risk behaviors.[15] Emerging adulthood, the transitional period between adolescence and full adulthood, is frequently characterized by the completion of required schooling and the inception of adult responsibilities, including gainful employment, long-term romantic relationships, parenting, and increased autonomy.[7,16] This developmental period is also marked by increased experimentation with risk behaviors that may have lasting health effects into adulthood. For example, compared with White women, Black emerging adult women are more likely to experience negative health and social consequences from substance use, including incarceration, sexual risks, and escalation to substance abuse.[17-19] In addition to increased engagement in sexual risk behaviors, this developmental stage may also include the exacerbation of mental health challenges which further increases vulnerability to poor mental health outcomes and HIV.[20]

To achieve 90-90-90 targets—an ambitious strategy put forth by UNAIDS aimed at ending the HIV epidemic in 2020 by ensuring that 90% of all people living with HIV know their status, receive sustained antiretroviral therapy (ART), and are virally suppressed[21]—we must develop and disseminate interventions that directly address the unique factors that heighten vulnerability to HIV among Black adolescent girls and emerging adult women. Although previous research identifies individual and social-structural factors that increase HIV risk among Black women, a more nuanced understanding of the drivers of HIV risk during key developmental stages is needed. The primary aim of this systematic review of recent literature is to characterize the individual, psychosocial, and social-structural determinants of HIV-related behaviors among Black adolescent girls and emerging adult women. The secondary aim is to describe the gaps in the reviewed literature and propose recommendations for future research and practice to address HIV disparities in Black women.

Methods

Literature Search

This systematic review was designed by a medical librarian (KN) in consultation with domain experts (TT, NM, TR). The search used both text word/phrase searches and con-

trolled vocabulary for four concepts: HIV prevention behaviors; adolescence; Black; and female. Articles without subject indexing, articles whose subject indexing did not show any geographic context, and articles whose subject indexing showed an American context, were all included in the screening process. Articles focused solely on countries outside of the United States were excluded. Articles with electronic publication dates before the starting date (October 1, 2017) of this review were excluded. Our focus on recent literature published within the last two years was motivated by wanting to capture emerging gaps in current research and generate recommendations for future areas of inquiry. The final search strategy was peer reviewed by an independent medical librarian for completeness. The search was conducted on September 30, 2019 on the Ovid platform in the database MEDLINE ALL. We also searched select conference databases for 2018 and 2019, including American Public Health Association (APHA) and Conference on Retroviruses and Opportunistic Infections (CROI).

Selection of Retrieved Articles

Articles retrieved from the bibliographic and conference databases were deduplicated in Covidence, a systematic review data management program, which was also used during the screening and data extraction phases of the review. We included publications in which the primary focus was on HIV prevention among Black adolescent girls and emerging adult women aged 13-25 years in the United States. We excluded publications that did not: 1) include findings for the target population (defined as a study with a sample consisting of 50% or greater cisgender Black adolescent girls and emerging adult women); 2) include HIV-related risks and behaviors (a priori defined as age at sexual initiation, condom use, age discordant sexual partners, number of sexual partners, and pre-exposure prophylaxis (PrEP))[2]; 3) conduct the study in the United States; and 4) report on etiology and risk. The titles, abstracts, and full texts were dual reviewed for inclusion by the first author (TT) and members of the research team. The interrater reliability between the reviewers was .92, indicating strong agreement. Discrepancies during full text review were discussed with a third reviewer (NM) until consensus was reached.

Data Extraction and Study Quality

Data were extracted from full text articles using a set of 15 defined fields related to the study design, sample size and characteristics, and study location; study purpose, key findings and implications; and HIV-related risks, behaviors, and determinants. Members of the research team independently extracted data from each article; the first author (TT) reviewed all extracted data for completeness and accuracy. The research team also conducted a quality assessment of the included studies using a checklist tool for use in systematic reviews of etiology and risk.[22] The checklist uses a series of questions about the study design, sample, and statistical analysis used to evaluate study rigor and quality. After reviewing the checklist for each study design, we decided that a minimum of 70% of the checklist criteria must be met for inclusion in the review.

Results

In total, 21 studies met the inclusion criteria (see PRISMA diagram, Figure 1).[23-43] Twelve study samples[23,25,27-30,33,37,38,41-43] included adolescents aged ≤17 years, five studies[24,26,34,35,39] included emerging adults aged 18-25 years, and four studies[31,32,36,40] included both adolescent girls and emerging adult women. Eighteen studies met 100% of the checklist criteria for inclusion in the review. The remaining three studies[28,34,39] met at least 75% of the checklist criteria. We did not exclude any full text articles based on study quality. Therefore, the studies included in this review showed strong methodological rigor in terms of the design and execution of research and demonstrated low risk of bias. In the following sections, we summarize the overarching trends in the literature assessing HIV-related behaviors among Black adolescent girls and emerging adult women. We then summarize the literature by the study sample's life course stage to show trends specific to each group.

Trends Across the Literature

Sixteen studies included condom use as an outcome; 12 studies assessed partner attributes and functions including number of sexual partners, sexual partner risks, and relationship characteristics; four studies included measures on PrEP (including PrEP knowledge and attitudes) as an out-

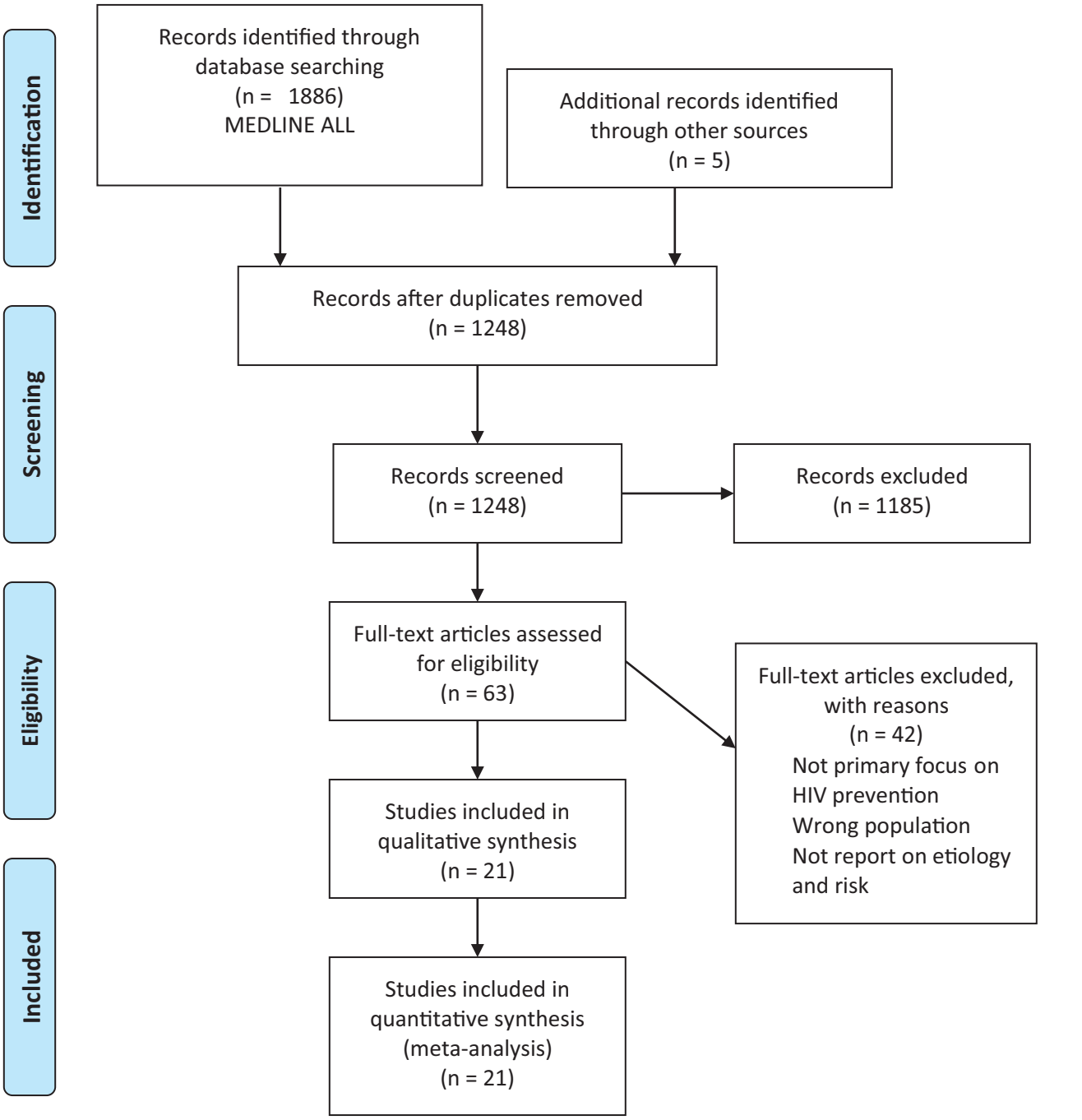

Figure 1. PRISMA flow diagram of study selection
From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. Doi: 10.1371/journal.pmed100097

come; and three studies assessed age at sexual initiation. Despite increasing trends in HIV incidence in rural and mixed rural-urban areas in the United States,[44,45] most of the studies included in the review (n=14) were in metropolitan areas, and the remaining seven studies used nationally representative or regional samples.[24,31,38-42] Seventeen studies used a cross-sectional study design and the remaining four studies used a longitudinal de-

sign.[26,27,29,32] Regarding study sample characteristics, one study focused on sexual minority adolescent girls,[33] one study focused on shelter-living homeless youth,[34] and three studies included parent-adolescent dyads.[23,28,37]

Adolescents

Several studies assessed psychosocial and identity factors as determinants of HIV-related behaviors. Of the 16 studies that included adolescent girls, two studies measured depression, anxiety, or mental health distress;[27,29] two studies assessed self-efficacy;[33,38] and one study included racial identity and socialization factors.[42] For example, Foley et al[29]examined the association between baseline depressive symptoms, assessed using an eight-item version of the Center for Epidemiological Studies Depression Scale, and sexual risk behaviors reported six months later in a sample of African American adolescents (N=782, 54% female). Results for adolescent girls indicated that depressive symptoms predicted sex with two or more partners (β=06, SE=.02, P<.001). They also found a significant indirect effect of depressive symptoms on condomless sex via decreased condom use self-efficacy.

Of the 16 studies, three studies[25,28,37] assessed adolescent HIV and sexual health knowledge, four studies[31,32,36,37] used self-report or laboratory confirmed STI history, and three studies[27,31,40] included measures of substance use as determinants of adolescent girls' HIV-related behaviors. One study used data from adolescent and emerging adult African American women (N=1862) who participated in one of three randomized controlled trials (RCTs) conducted in Atlanta, Georgia.[40] The researchers pooled baseline and follow-up data from participants assigned to the standard of care control conditions in each RCT. The trials were developed to assess the efficacy of behavioral HIV/STI prevention interventions for African American women aged 14 to 24 years. The results from the study suggested that alcohol quantity was associated with greater frequency of sex at all ages, an increased likelihood of having multiple sex partners from about age 17 to 24 years, and an increased likelihood of condomless sex after age 18.5 years. They also found that marijuana use was associated with an increased likelihood of having multiple sex partners at ages 17 to 24 years.

Three studies assessed the influence of religiosity on HIV-related behaviors.[30,41,42] One study measured religiosity with two items that captured engagement with organized religious activities (eg, service attendance).[30] The other two studies used an index of religiosity that assessed organized religious activities and more private aspects of religiosity (eg, prayer, scripture reading, and belief in a higher power).[41,42] Despite using different measures, these studies found that religiosity was protective against condom misuse, having multiple sexual partners, and adolescent sexual initiation.

A number of studies also examined family structure and parental influence as determinants of HIV-related behaviors. Three studies[25,37,43] assessed parental communication, one study[27] assessed parental communication with maternal rejection, two studies[25,43] measured parental monitoring, and four studies[25,28,31,37] included parental attitudes and knowledge about HIV and sexual health. For example, Shah et al measured PrEP acceptability and barriers in a sample of 102 African American adolescent (66.7% female) and parent pairs seeking health care at an adolescent clinic and emergency department.[37] Study findings showed that both adolescents and their parents identified low HIV risk perception and poor PrEP and HIV knowledge as barriers to adolescent PrEP uptake. Findings from this study also suggested the need to educate parents and adolescents on HIV risk assessment and PrEP as a viable HIV prevention strategy.

Regarding studies that also assessed the links between adolescent girls' social-structural environment and HIV-related behaviors, three studies[17,27,33] assessed peer influence and one study measured social norms.[38] For example, Voisin et al assessed correlates of gang involvement (including neighborhood quality, trauma history, peer influence, parental monitoring and communication, and housing instability factors) and associations between these factors and HIV-related behaviors in a sample of 188 African American adolescent girls who were in a short-term detention facility in Atlanta, Georgia.[43] They found that gang involvement was significantly related to having one or more casual sex partners (P=.04); higher rates of condom misuse (P=.04); and a lower likelihood of ever having been tested for HIV (P=.027).

Surprisingly, we identified only one study that assessed bullying or peer victimization as a determinant of HIV-related behaviors.[32] In a sample of 1274 adolescent girls in Pittsburgh,

Pennsylvania, Norcott et al measured prospective associations between sexual harassment (defined as physical bullying of a sexual nature) during adolescence and high-risk sexual activity at ages 16 to 20 years.[32] Results indicated that, compared with participants who had not been sexually harassed, those who experienced sexual harassment as adolescents (21%) were more likely to have multiple sexual partners in the last 30 days (mixed model P=.007) and were more likely to have contracted an STI in early adulthood (OR=1.9, 95% CI = [1.3, 2.8]). Findings from this study suggested that unpacking bullying, especially identifying bullying of a sexual nature, is important to developing targeted HIV prevention interventions for African American adolescent girls.

Emerging Adults

Nine studies included Black emerging adult women aged 18-25 years.[24,26,31,32,34-36,39,40] Most of these studies assessed individual-level factors related to psychosocial risk, identity, cognitive functioning, and other risk behaviors as determinants of HIV-related behaviors. Three studies[26,31,40] assessed substance use and found that drug and alcohol use was positively associated with sexual risk behaviors. For example, one study created a syndemic index of psychosocial risk factors (ie, depression, drug use, alcohol use, and anxiety) to examine the relationship between psychosocial risk trajectories during adolescence and HIV-related behaviors in adulthood.[26] Results indicated that adolescents reporting more co-occurring psychosocial risks were more likely to report: condomless sex at last sexual intercourse with their primary and secondary partner; sexual intercourse with someone they just met; more than four sexual partners; and drug use prior to sexual intercourse. These findings suggested that psychosocial risks during adolescence have lasting effects on engagement in sexual risk behaviors during emerging adulthood.

We identified one study that included ethnic identity and socialization as determinants of HIV-related behaviors in emerging adult women.[24] This study used a subsample of data (African American (n= 271) and Afro Caribbean (n=127) students, (72.9% female) from the University Study of Multi-Site Identity and Culture (MUSIC) research collaborative to examine the associations between risk behaviors (including substance use and sexual risk behaviors), ethnic identity, and ethnic-racial socialization. The researchers reported no significant difference between African American and Afro Caribbean students on the outcomes of interest and therefore combined the two groups for use in regression analyses. Their analyses showed that ethnic identity significantly predicted lower substance use (IRR=-.49, 95% CI [-.85, -.12], P<.01); however, ethnic-racial socialization was not a significant predictor of substance use or sexual risk behaviors. Findings from this study suggested that components of ethnic identity may be protective against alcohol and drug use and may also be useful in developing culturally congruent interventions for African American and Afro Caribbean college students.

One study examined the relationship between the level of self-reported executive function and engagement in risk taking behaviors among a sample of shelter-living urban homeless youth (N=149, 53% female, 76% Black).[34] Study authors defined executive function as a set of higher-order cognitive skills that includes processes such as decision-making, inhibition, reasoning, working memory, planning, and emotion and behavior regulation. Analyses revealed an association between the level of self-reported executive function and risk-taking behaviors. Specifically, youth with low self-reported executive function had a higher number of lifetime sexual partners (M=4.70, SD=1.94) as compared with the high self-reported executive function group (M=3.64, SD=1.87), P=.029. This study also identified ways community and social service resources for homeless youth could be leveraged to guide intervention and policy development.

Three studies assessed social-structural factors as possible determinants of HIV-related behaviors including family functioning,[31] relationship characteristics like sexual relationship power,[39] and bullying or peer victimization.[32] For example, Stokes et al used data from a small convenience sample of sexually active Black emerging adult women (N=57, M_{age}=19.6, SD=1.4) who answered questions about their current or most recent dating relationship and sexual behaviors.[39] Findings showed that higher levels of self-silencing were significantly related to lower condom use frequency (β=–0.46, t=–2.84, P=.006) and to a decreased likelihood of reporting condom use at last sex (OR=.95,

95% CI = [.91–1.00]). They found no significant associations between sexual relationship power and condom use frequency or use at last sex.

Discussion

Black adolescent girls and emerging adult women remain disproportionately affected by the global HIV epidemic. Despite numerous prevention efforts, HIV rates for Black women continue to increase, which underscores the need to better understand the etiology and risks that heighten their vulnerability to HIV. In our present study, we used a life course approach[7,8,46] to examine the recent literature on HIV-related behaviors among Black adolescent girls and emerging adult women. The life course approach is particularly salient to understanding drivers of HIV disparities in young people.[7,8] When applied to HIV, the life course approach emphasizes that: 1) vulnerability to HIV varies as young women transition through different developmental stages; 2) developmental transitions are influenced by individual and contextual factors; and 3) developmental transitions and risk behaviors are gendered. Our review revealed important trends and gaps in the current research that may strengthen our ability to develop HIV prevention programs for Black women in the United States.

Similar to other reviews,[47,48] we found that most studies of Black adolescent girls assessed family functioning, parental monitoring, and parent-adolescent communication as determinants of HIV-related behaviors. Although findings from these studies were mixed, most showed a negative association between parental involvement and communication, and adolescent sexual risk. However, none of the studies that included Black emerging adult women assessed communication with parents. Recent literature shows that emerging adults who report more open and frequent communication with their parents are more likely to report positive social and psychosocial well-being.[49,50] Given the associations between positive well-being and engagement in health protective behaviors among adults, as well as the association between parental communication and reduced sexual risk among adolescents, more research on this association among emerging adult women is warranted. If such an association is found, family-based HIV prevention interventions for adolescents[51,52] could be adapted to the prevention and communication needs of emerging adults. For example, these interventions could include strategies for the maintenance of positive, open, and nurturing parent-child relationships during emerging adulthood.

Despite overwhelming evidence of the importance of neighborhood characteristics in understanding health behaviors and outcomes,[53,54] our review of recent literature showed that most studies did not assess neighborhood characteristics as determinants of HIV-related behaviors. This gap is particularly troubling given the routes by which Black adolescent girls and emerging adult women are exposed to HIV. Neighborhoods have a significant influence on sexual relationships and relationship dynamics.[55-57] For example, neighborhoods with more alcohol outlets and drug markets provide venues that increase exposure to behaviorally risky partners and casual relationships. In addition, neighborhoods with low male-to-female sex ratios increase perceptions of partner availability, disrupt romantic partnerships, and promote high-risk sexual relationships (eg, sexual concurrency).[55,58] Moreover, Black women frequently have dense racially and geographically homogenous sexual networks, which further increases their risk of HIV. By not capturing the geographic and social variation that exists for Black adolescent girls and emerging adult women, we are not able to fully under-

Despite overwhelming evidence of the importance of neighborhood characteristics in understanding health behaviors and outcomes,[53,54] our review of recent literature showed that most studies did not assess neighborhood characteristics as determinants of HIV-related behaviors.

stand how these contexts, and experiences within these contexts, potentiate HIV risk. Future research would benefit from using existing technology and methods to better understand neighborhood-related HIV risks during adolescence and emerging adulthood. For example, geographically explicit ecological momentary assessment (GEMA) studies are currently used to capture spatial and temporal data on HIV-related behaviors within an individual's context.[59] Most of these studies have been conducted in samples of young men who have sex with men; however, adapting these methodologies to young Black women remains open for future study.

Conclusions

Studies included in our review were of high quality and low risk of bias. However, there are a number of research gaps in the recent literature that should be addressed in future studies. Studies in this review treated Black adolescents and emerging adults as ethnically and racially homogeneous, missing potential differences in culture, development, and family practices that may be important to understanding HIV risk and to developing effective interventions. Our review identified only one study that assessed HIV-related behaviors among sexual minority women. Previous studies show that women who have sex with other women engage in sexual behaviors that increase their risk for HIV and other STIs due to variations in sexual identity, attraction, and behaviors.[60] More intervention research is needed to develop targeted sexual health information and clinical guidelines that support a more expansive view of female sexuality. Lastly, although our review was designed to assess the etiology of HIV-related behaviors, there is a significant gap in the literature on protective factors for young Black women. Most studies in our review positioned religiosity, ethnic identity, and parent-child communication as protective. However, more studies are needed that explicitly study associations between resilience factors at the individual and community levels and HIV-related behaviors.

Conflict of Interest

No conflicts of interest to report.

Author Contributions

Research concept and design: Taggart, Milburn, Nyhan, Ritchwood; Acquisition of data: Taggart, Nyhan; Data analysis and interpretation: Taggart, Milburn; Manuscript draft: Taggart, Nyhan, Ritchwood; Administrative: Taggart, Nyhan, Ritchwood; Supervision: Taggart, Milburn

References

1. Centers for Disease Control and Prevention. *HIV Surveillance Report, 2017*; vol. 29. 2018. Last accessed Jan. 20, 2020 from http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html.
2. Centers for Disease Control and Prevention. *HIV among Women*. Last accessed Jan. 20, 2020 from https://www.cdc.gov/hiv/group/gender/women/index.html.
3. Centers for Disease Control and Prevention. *HIV among Youth, 2017*. Last accessed Jan. 20, 2020 from https://www.cdc.gov/hiv/group/age/youth/index.html.
4. Brawner BM. A multilevel understanding of HIV/AIDS disease burden among African American women. *J Obstet Gynecol Neonatal Nurs*. 2014;43(5):633-643. https://doi.org/10.1111/1552-6909.12481 PMID:25139057
5. LeBlanc TT, Sutton MY, Thomas P, Duffus WA. HIV and STI Risk for young blacks in high prevalence areas: implications for health equity in communities hosting historically black colleges and universities (HBCUs). *J Health Dispar Res Pract*. 2014;7(1):article 5. PMID:28845365
6. Conduct Problems Prevention Research Group. Trajectories of risk for early sexual activity and early substance use in the Fast Track prevention program. *Prev Sci*. 2014;15(S1) (suppl 1):S33-S46. https://doi.org/10.1007/s11121-012-0328-8 PMID:23417666
7. Arnett JJ. Emerging adulthood. A theory of development from the late teens through the twenties. *Am Psychol*. 2000;55(5):469-480. https://doi.org/10.1037/0003-066X.55.5.469 PMID:10842426
8. Lynch J, Smith GD. A life course approach to chronic disease epidemiology. *Annu Rev Public Health*. 2005;26(1):1-35. https://doi.org/10.1146/annurev.publhealth.26.021304.144505 PMID:15760279
9. World Health Organization. *Adolescent Development*. May 9, 2017. Last accessed Jan. 20, 2020 from https://www.who.int/maternal_child_adolescent/topics/adolescence/development/en/.
10. Tolman DL, Striepe MI, Harmon T. Gender matters: constructing a model of adolescent sexual health. *J Sex Res*. 2003;40(1):4-12. https://doi.org/10.1080/00224490309552162 PMID:12806527
11. Kann L, Kinchen S, Shanklin SL, et al; Centers for Disease Control and Prevention (CDC). Youth Risk Behavior Surveillance—United States, 2013. *MMWR Suppl*. 2014;63(4):1-168. PMID:24918634
12. Sandfort TG, Orr M, Hirsch JS, Santelli J. Long-term health correlates of timing of sexual debut: results from a national US study. *Am J Public Health*. 2008;98(1):155-161. https://doi.org/10.2105/AJPH.2006.097444 PMID:18048793
13. Kann L, McManus T, Harris WA, et al. Youth Risk Behavior Surveillance—United States, 2017. *MMWR Surveill Summ*. 2018;67(8):1-114. https://doi.org/10.15585/mmwr.ss6708a1 PMID:29902162
14. Ritchwood TD, Penn DC, DiClemente RJ, Rose ES, Sales JM. Influence of sexual sensation-seeking on factors associated with risky sexual behaviour among African-American female adolescents. *Sex Health*. 2014;11(6):540-546. https://doi.org/10.1071/SH14075 PMID:25355174
15. Claxton SE, van Dulmen MH. Casual sexual relationships and experiences in emerging adulthood. *Emerg Adulthood*. 2013;1(2):138-150. https://doi.org/10.1177/2167696813487181
16. Schwartz SJ, Petrova M. Prevention science in emerging adulthood: A field coming of age. *Prev Sci*. 2019;20(3):305-309. https://doi.org/10.1007/s11121-019-0975-0 PMID:30637671
17. Volkow ND, Baler RD, Compton WM, Weiss SR. Adverse health effects of marijuana use. *N Engl J Med*. 2014;370(23):2219-2227. https://doi.org/10.1056/NEJMra1402309 PMID:24897085

18. Stevens-Watkins D, Perry B, Harp KL, Oser CB. Racism and illicit drug use among African American women: the protective effects of ethnic identity, affirmation, and behavior. *J Black Psychol*. 2012;38(4):471-496. https://doi.org/10.1177/0095798412438395 PMID:24482547
19. Hammett TM, Drachman-Jones A. HIV/AIDS, sexually transmitted diseases, and incarceration among women: national and southern perspectives. *Sex Transm Dis*. 2006;33(7)(suppl):S17-S22. https://doi.org/10.1097/01.olq.0000218852.83584.7f PMID:16794551
20. Rohde P, Lewinsohn PM, Klein DN, Seeley JR, Gau JM. Key characteristics of major depressive disorder occurring in childhood, adolescence, emerging adulthood, adulthood. *Clin Psychol Sci*. 2013;1(1):41-53. https://doi.org/10.1177/2167702612457599 PMID:24273703
21. UNAIDS. *90-90-90: An Ambitious Treatment Target to Help End the AIDS Epidemic. 2019.* Last accessed Jan. 20, 2020 from https://www.unaids.org/en/resources/909090.
22. Moola S, Munn Z, Tufanaru C, et al. Systematic reviews of etiology and risk. In: Aromataris E, Munn Z, eds. *Joanna Briggs Institute Reviewer's Manual*. Adelaide, Australia: The Joanna Briggs Institute; 2017.
23. Bonafide KE, Vanable PA, Carey MP. The association between African American parent-child sex communication and adolescent condomless sex. *AIDS Behav*. 2019. https://doi.org/10.1007/s10461-019-02504-w PMID:30980278
24. Bowman Heads AM, Glover AM, Castillo LG, Blozis S, Kim SY. Dimensions of ethnic identity as protective factors for substance use and sexual risk behaviors in African American college students. *J Am Coll Health*. 2018;66(3):178-186. https://doi.org/10.1080/07448481.2017.1400975 PMID:29236579
25. Causey S, High B. An exploration of the ecological context of low-income, urban African-American adolescent sexual risk. *J Race Eth Health Dispar*. 2020;7:52-61.
26. Córdova D, Heinze JE, Hsieh HF, et al. Are trajectories of a syndemic index in adolescence linked to HIV vulnerability in emerging and young adulthood? *AIDS*. 2018;32(4):495-503. PMID:29239889
27. Donenberg G, Emerson E, Mackesy-Amiti ME, Fletcher F. Sexual risk among African American girls seeking psychiatric care: A social-personal framework. *J Consult Clin Psychol*. 2018;86(1):24-38. https://doi.org/10.1037/ccp0000270 PMID:29300099
28. Fletcher FE, Fisher C, Buchberg MK, et al. "Where did this [PrEP] come from?" African American mother/daughter perceptions related to adolescent preexposure prophylaxis (PrEP) utilization and clinical trial participation. *J Empir Res Hum Res Ethics*. 2018;13(2):173-184. https://doi.org/10.1177/1556264618755919 PMID:29471706
29. Foley JD, Vanable PA, Brown LK, et al. Depressive symptoms as a longitudinal predictor of sexual risk behaviors among African-American adolescents. *Health Psychol*. 2019;38(11):1001-1009. https://doi.org/10.1037/hea0000780 PMID:31380687
30. Hope MO, Lee DB, Hsieh HF, Hurd NM, Sparks HL, Zimmerman MA. Violence exposure and sexual risk behaviors for african american adolescent girls: the protective role of natural mentorship and organizational religious involvement. *Am J Community Psychol*. 2019;64(1-2):241-254. https://doi.org/10.1002/ajcp.12341 PMID:31206754
31. Li YH, Mgbere O, Abughosh S, et al. Assessment of sexually transmitted disease/HIV risk among young African Americans: comparison of self-perceived and epidemiological risks utilizing ecodevelopmental theory. *HIV AIDS (Auckl)*. 2019;11:31-44. https://doi.org/10.2147/HIV.S189482 PMID:30863188
32. Norcott C, Keenan K, Wroblewski K, Hipwell A, Stepp S. The Impact of adolescent sexual harassment experiences in predicting sexual risk-taking in young women. *J Interpers Violence*. 2019;[Epub ahead of print]. https://doi.org/10.1177/0886260519845733 PMID:31057024
33. Norris AL, Brown LK, DiClemente RJ, et al. African-American sexual minority adolescents and sexual health disparities: an exploratory cross-sectional study. *J Natl Med Assoc*. 2019;111(3):302-309. https://doi.org/10.1016/j.jnma.2018.11.001 PMID:30514572
34. Piche J, Kaylegian J, Smith D, Hunter SJ. The relationship between self-reported executive functioning and risk-taking behavior in urban homeless youth. *Behav Sci (Basel)*. 2018;8(1):E6. https://doi.org/10.3390/bs8010006 PMID:29301347
35. Sales JM, Sheth AN. Associations among perceived HIV risk, behavioral risk and interest in PrEP among black women in the southern US. *AIDS Behav*. 2019;23(7):1871-1876. https://doi.org/10.1007/s10461-018-2333-9 PMID:30387025
36. Sales JM, Steiner RJ, Brown JL, Swartzendruber A, Patel AS, Sheth AN. PrEP Eligibility and interest among clinic- and community-recruited young Black women in Atlanta, Georgia, USA. *Curr HIV Res*. 2018;16(3):250-255. https://doi.org/10.2174/1570162X16666180731143756 PMID:30062969
37. Shah M, Gillespie S, Holt S, Morris CR, Camacho-Gonzalez AF. Acceptability and barriers to HIV pre-exposure prophylaxis in Atlanta's adolescents and their parents. *AIDS Patient Care STDS*. 2019;33(10):425-433. https://doi.org/10.1089/apc.2019.0109 PMID:31436485
38. Shepherd LM, Sly KF, Girard JM. Comparison of comprehensive and abstinence-only sexuality education in young African American adolescents. *J Adolesc*. 2017;61:50-63. https://doi.org/10.1016/j.adolescence.2017.09.006 PMID:28963952
39. Stokes LR, Brody LR. Self-Silencing, but not sexual relationship power associated with condom use for Black college-aged women. *Behav Sci (Basel)*. 2019;9(2):E13. https://doi.org/10.3390/bs9020013 PMID:30696006
40. Swartzendruber A, Brown JL, Sales JM, Windle M, Haardörfer R. Age-related associations between substance use and sexual risk behavior among high-risk young African American women in the South. *Addict Behav*. 2019;96:110-118. https://doi.org/10.1016/j.addbeh.2019.04.031 PMID:31075728
41. Taggart T, Gottfredson N, Powell W, et al. The role of religious socialization and religiosity in African American and Caribbean Black adolescents' sexual initiation. *J Relig Health*. 2018;57(5):1889-1904. https://doi.org/10.1007/s10943-018-0605-3 PMID:29564617
42. Taggart T, Powell W, Gottfredson N, Ennett S, Eng E, Chatters LM. A person-centered approach to the study of Black adolescent religiosity, racial identity, and sexual initiation. *J Res Adolesc*. 2019;29(2):402-413. https://doi.org/10.1111/jora.12445 PMID:31206880
43. Voisin DR, King KM, Diclemente RJ, Carry M. Correlates of gang involvement and health-related factors among African American females with a detention history. *Child Youth Serv Rev*. 2014;44:120-126. https://doi.org/10.1016/j.childyouth.2014.05.001 PMID:29416192
44. Reif SS, Whetten K, Wilson ER, et al. HIV/AIDS in the Southern USA: a disproportionate epidemic. *AIDS Care*. 2014;26(3):351-359. https://doi.org/10.1080/09540121.2013.824535 PMID:23944833
45. Strathdee SA, Beyrer C. Threading the needle—how to stop the HIV outbreak in rural Indiana. *N Engl J Med*. 2015;373(5):397-399. https://doi.org/10.1056/NEJMp1507252 PMID:26106947
46. Elder GH Jr. The life course as developmental theory. *Child Dev*. 1998;69(1):1-12. https://doi.org/10.1111/j.1467-8624.1998.tb06128.x PMID:9499552
47. Fleary SA, Joseph P, Pappagianopoulos JE. Adolescent health literacy and health behaviors: A systematic review. *J Adolesc*. 2018;62:116-127. https://doi.org/10.1016/j.adolescence.2017.11.010 PMID:29179126
48. Santa Maria D, Markham C, Bluethmann S, Mullen PD. Parent-based adolescent sexual health interventions and effect on communication outcomes: a systematic review and meta-analyses. *Perspect Sex Reprod Health*. 2015;47(1):37-50. https://doi.org/10.1363/47e2415 PMID:25639664

49. Portugal AP, Beja MJ, Cunha D, Camacho F, Spínola J, Santos AS. Emerging adulthood and parent-child communication: A validation study with Perception Scale of Parenting Communication. *Int J Psychol Psychol Ther*. 2019;19(2):203-215.
50. Keijsers L, Poulin F. Developmental changes in parent-child communication throughout adolescence. *Dev Psychol*. 2013;49(12):2301-2308. https://doi.org/10.1037/a0032217 PMID:23477535
51. Lightfoot M, Milburn N. Common elements of family-based HIV interventions for adolescents. *Couple Family Psychol*. 2012;1(2):120-133. https://doi.org/10.1037/a0028832
52. van Rooyen H, Essack Z, Rochat T, et al. Taking HIV testing to families: designing a family-based intervention to facilitate HIV testing, disclosure, and intergenerational communication. *Front Public Health*. 2016;4:154. https://doi.org/10.3389/fpubh.2016.00154 PMID:27547750
53. Diez Roux AV. Neighborhoods and health: what do we know? What should we do? *Am J Public Health*. 2016;106(3):430-431. https://doi.org/10.2105/AJPH.2016.303064 PMID:26885960
54. Furr-Holden CD, Lee MH, Johnson R, et al. Neighborhood environment and marijuana use in urban young adults. *Prev Sci*. 2015;16(2):268-278. https://doi.org/10.1007/s11121-014-0497-8 PMID:25005818
55. Adimora AA, Schoenbach VJ, Taylor EM, Khan MR, Schwartz RJ, Miller WC. Sex ratio, poverty, and concurrent partnerships among men and women in the United States: a multilevel analysis. *Ann Epidemiol*. 2013;23(11):716-719. https://doi.org/10.1016/j.annepidem.2013.08.002 PMID:24099690
56. Nunn A, Dickman S, Cornwall A, et al. Social, structural and behavioral drivers of concurrent partnerships among African American men in Philadelphia. *AIDS Care*. 2011;23(11):1392-1399. https://doi.org/10.1080/09540121.2011.565030 PMID:21981345
57. Jennings JM, Taylor RB, Salhi RA, Furr-Holden CDM, Ellen JM. Neighborhood drug markets: a risk environment for bacterial sexually transmitted infections among urban youth. *Soc Sci Med*. 2012;74(8):1240-1250. https://doi.org/10.1016/j.socscimed.2011.12.040 PMID:22386616
58. Khan MR, Behrend L, Adimora AA, Weir SS, Tisdale C, Wohl DA. Dissolution of primary intimate relationships during incarceration and associations with post-release STI/HIV risk behavior in a Southeastern city. *Sex Transm Dis*. 2011;38(1):43-47. https://doi.org/10.1097/OLQ.0b013e3181e969d0 PMID:20739913
59. Duncan DT, Park SH, Goedel WC, Sheehan DM, Regan SD, Chaix B. Acceptability of smartphone applications for global positioning system (GPS) and ecological momentary assessment (EMA) research among sexual minority men. *PLoS One*. 2019;14(1):e0210240. https://doi.org/10.1371/journal.pone.0210240 PMID:30689651
60. Lindley LL, Walsemann KM, Carter JW Jr. Invisible and at risk: STDs among young adult sexual minority women in the United States. *Perspect Sex Reprod Health*. 2013;45(2):66-73. https://doi.org/10.1363/4506613 PMID:23750620