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To cite this article: Sarah Moore, Michaela L. Zajicek-Farber & Linda Plitt Donaldson (2022): A snapshot of HIV/AIDS knowledge, behaviors, and attitudes of Ethiopian immigrants in the District of Columbia, *Journal of Ethnic & Cultural Diversity in Social Work*, DOI: [10.1080/15313204.2022.2154879](https://doi.org/10.1080/15313204.2022.2154879)

To link to this article: <https://doi.org/10.1080/15313204.2022.2154879>



Published online: 07 Dec 2022.



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# A snapshot of HIV/AIDS knowledge, behaviors, and attitudes of Ethiopian immigrants in the District of Columbia

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## ABSTRACT

Washington, D.C. continues to lead the nation in the rate of HIV infection. This urban area has the largest Ethiopian population in the United States, yet very little has been known about the knowledge, behaviors, and attitudes regarding HIV/AIDS of adult Ethiopian immigrants in the District. Based on a community-based participatory research (CBPR) project, this article reports the findings of the perceptions of HIV/AIDS knowledge, behaviors, and attitudes of 60 Ethiopian immigrants using a cross-sectional survey. Results describe challenges in immigrants' knowledge, risk-behaviors, and stigmatizing attitudes toward others with HIV/AIDS. Study implications, limitations, and future research are addressed.

## KEYWORDS

AIDS; Ethiopian; HIV; immigrant; knowledge; stigma; Community-based participatory research; CBPR

## Introduction

The global impact of HIV/AIDS reaches beyond borders and is arguably one of the most important public health issues of the last century. The Centers for Disease Control and Prevention (CDC; 2018) reported that 1.1 million people in the United States have acquired HIV, and around 15% of those individuals do not know they have been infected. The CDC's most recent estimates on the prevalence of HIV show that the rates of infection have been slowly decreasing between 2014–2018, yet the District of Columbia continues to lead the nation in the rate of HIV infection with 12,408 (1.8% in 2019) and 12,161 (1.7% in 2020) individuals living with HIV/AIDS (DC Department of Health, HIV/AIDS, Hepatitis, STD and TB Administration (HAHSTA), 2019, 2020, 2021). The latest DC Department of Health, HIV/AIDS, Hepatitis, STD and TB Administration (HAHSTA), 2021 report estimates that the 2020 proportion of District's residents living with HIV/AIDS (n = 12, 161) includes 71.4% Blacks (of 44.4% of Black residents), 15.0% Whites (of 37.5% White residents), and 8.2% Latino (of 11.3% Latino residents); 71.7% males (of 47.4% male residents) and 26.0% females (of 52.6% female residents); and 38.9% were of 30–49 years, and 53.2% were 50 years or older.

In DC in 2020, of the Black individuals with HIV, 64.8% were males and 32.9% were females, 37.8% were 30–49 years, and 53.7% were 50 years or older. The most frequent mode of HIV transmission for Black males was having male sex with males (55.7%), followed by hetero sex (17.6%), no identifiable risk (10.9%), injecting drugs (9.3%), and engaging in male sex with drugs (5.7%), whereas for Black females, the most frequent HIV transmission was hetero sex (67.3%), followed by injecting drugs (16.8%) and risk not identifiable (13.4%). Despite the importance of these statistics, gaps in our understanding remain because the District does not disaggregate the category of "Black" to include country-of-origin. Therefore, potential differences in prevalence among foreign-born Blacks and US-

born Blacks remain obscured and can create challenges for HIV prevention and treatment (Demeke et al., 2018; Koku et al., 2016).

The literature shows that African immigrants and refugees have HIV infection rates six times higher than any other minority group in the U.S. (Kingori et al., 2016). The DC metro area has the largest (53,500) immigrant Ethiopian population of all urban metro areas in the U.S., showing 61% increase from 2010 to 2019 (Institute for Immigration Research-George Mason University, 2019). However, very little is known about the knowledge, behaviors, or attitudes toward HIV/AIDS of Ethiopians in the District, despite Ethiopian immigrants having high national rates (14.8%) of HIV diagnosis (Demeke et al., 2018). Indeed, the DC Mayor's recent plan for ending HIV/AIDS recognized a great need for the engagement of the entire community in addressing the virus and its disease (DC Department of Health, Washington AIDS Partnership & DC Appleseed, 2020). Yet, there is a gap in research on HIV/AIDS related to the needs of the Ethiopian community in the Washington, DC metro area.

To address this gap, researchers at The Catholic University of America and leaders of the Holistic HIV Service Network, an association of Ethiopian community members with extensive experience in support, counseling, and advocacy, both located in the District, partnered on a study that examined the knowledge, risk behaviors, concerns, and attitudes associated with HIV/AIDS among immigrant members of the Ethiopian community. The leaders of the Holistic HIV Service Network who initiated the current study, were part of the original group that fought the spread of HIV/AIDS in Ethiopia. Since 2010, Ethiopia has decreased the number of new HIV infections, including a 45% decrease in the number of AIDS-related deaths (United Nations Programme on HIV and AIDS (UNAIDS), 2019). Following their Ethiopian efforts, these leading members migrated to the U.S., where they discovered that research and the District offered limited data or information on HIV/AIDS specific to the Ethiopian immigrant community. This study is a response to their call for such relevant data for their community.

### **Literature review**

In 2022, the Migration Policy Institute reported that there were 256,000 Ethiopian immigrants living in the U.S. by 2019. They were considered a relatively highly educated group, as over 30% of Ethiopian adults aged 25 or older held at least a 4-year college degree, when compared to 32% of U.S. born adults. The data also indicated that 45% of the Ethiopian women were married, around 20% spoke only English at home, and 75.9% participated in labor; and the Ethiopian community has a 19.7% poverty rate, compared to 14.9% of the U.S. poverty rate.

Research on HIV/AIDS perceptions, knowledge, and risk behaviors of African immigrants in the U.S. has revealed that while African immigrants may have a high level of knowledge about modes of HIV transmission, many also report low self-perceived risk for contracting HIV, and have low knowledge of resources and options for treatment or prevention (Akinsulure-Smith, 2014). African immigrant women, who tend to have higher knowledge of HIV transmission than men, also experience many structural and cultural barriers to care, including misunderstandings about modes of HIV transmission, legal status, linguistic problems, and fear of the American health system (Foley, 2005). In an extensive review on HIV on African immigrants, Blanas et al. (2013) uncovered that HIV rates were higher for African immigrants, especially women, who were diagnosed at later stages, while they also had higher HIV rates for heterosexual transmission, but lower rates for drug use transmission. Other studies have revealed that associations between HIV stigmatizing attitudes and having poor or inaccurate knowledge of HIV/AIDS transmission (Berkley-Patton et al., 2013), lower education (Coleman et al., 2016; Kerr et al., 2014), and gender, age, and religiosity of participants (Coleman et al., 2016; Lindley et al., 2010) create many prevention, testing, and intervention challenges. Within the U.S., Blanas et al. (2013) called for more research to better understand specific needs of different African immigrant communities. Wafula and Snipes (2014) further showed that cultural and religious barriers were the key reasons why Black immigrants in the U.S. hesitate to seek health care and

impeded their diagnosis of HIV. They highlighted that African immigrants/refugees often have concerns about confidentiality, mistrust healthcare professional providers, or medications for treatment, or lesser-known technological devices, and need an individually culturally sensitive tailoring of interventions, or even making contacts. Therefore, to reduce the research gap on HIV/AIDS for the Ethiopian community, the current study provides a snapshot of quantitative information on the knowledge of HIV/AIDS, concerns, risk-behaviors, and stigmatizing attitudes of 60 adult Ethiopian immigrants living in the D.C. metro area.

## **Methodology**

This study is a part of a community-based participatory research (CBPR) project. As a collaborative approach to research, CBPR involves all partners in the process of the research development and implementation (Coughlin, 2016). The community partners, Holistic HIV Service Network, were involved in every step of the project, including setting goals and project organization, selecting research design and instruments, and participant recruitment. They determined that there should be both qualitative and quantitative data collected; therefore, the study is two-part. The first part of the study examined qualitative viewpoints of 60 Ethiopian adults in the DC metro area on how to improve HIV/AIDS prevention and treatment for the Ethiopian community (Oliphant & Donaldson, 2019). The second part, reported in this current study, specifically examines the quantitative data on the knowledge, risk behaviors, , and attitudes toward HIV/AIDS among the 60 Ethiopian adults. The sample size was determined based on the CBPR collaborative decision-making regarding the feasibility of recruitment in the community, while considering it a first effort in gathering data on an unrepresented population for which there was no data available, because the District only reports data for the Black population in aggregate. Similarly, the availability and non-probability sample selection was primarily based on the community partners' recommendations for recruitment through reaching out to the Ethiopian community members in public settings and their own personal networks. As the community partners also hoped to gain insight into the needs of the Ethiopian immigrant community for future planning, the CBPR collaboration determined that the collected data be exploratory, and had to meet the needs of the whole project.

## **Design and procedures**

This quantitative cross-sectional study uses a correlational descriptive research design. The quantitative data were collected in a 40-minute-long structured survey, conducted during in-person interviews at the location of participants choosing to maintain a comfortable level of privacy. The community partners preferred the option of conducting in-person interviews in order to be able to collect simultaneous participants' responses both for quantitative and qualitative questions. The interviews were systematized with an interview guide, first by presenting structured (closed-ended) quantitatively driven questions on participants' knowledge, concerns, risk behaviors, and attitudinal stigma, and demographics, later followed by qualitative questions reported on separately. The survey guide was pre-tested with a small sample of Ethiopian members, as a way to assure salience and sensitivity to individual concerns. Prior to the start of the study, the interviewers were trained in the appropriate confidentiality procedures by the leading author. As social workers, all of the study's three authors had extensive community training and working experience with varied populations and appropriate certification for conducting research with human subjects. The complete study, and all its aspects, were approved by the Institutional Review Board (IRB) of The Catholic University of America.

The study participants were recruited by members of the Holistic HIV Service Network, community team at various DC metro locations, including coffee shops and churches, in the fall of 2017. Upon contact, participants were told about the study and invited to participate; those who voluntarily accepted the invitation were paired with a research team-interviewer and provided with Informed Consent. Upon providing written consent, participants were interviewed using an interview guide,

into which the interviewer recorded by hand the participants' selected answers. To protect the confidentiality of the participants, participants did not use their names and the interview guide document was completely deidentified with a random numeric. At the conclusion of the interview, participants received a \$25 Visa gift card. All confidential contact information related to the setting of appointments were kept separately from the survey responses by the lead investigator, according to the approved IRB protocol.

## Measures

The interview guide included demographic questions on primary language, age, sex, religion, marital status, length of time in the U.S., education, and employment status; and measures for knowledge of HIV/AIDS, concerns, engagement in risk behaviors, and attitudinal stigma.

*Knowledge of HIV/AIDS* was measured with 10 questions with a true/false format for responses. A higher total summated score represented the participants' overall higher knowledge of HIV/AIDS. Based on the input from the local community partners, the questions were adapted from two standardized scales on HIV knowledge with known acceptable validity and reliability (Carey & Schroder, 2002; Kuznetsov et al., 2011).

*Concerns and engagement in risk behaviors regarding HIV/AIDS* were based on a standardized risk assessment (Rowan et al., 2016) with known acceptable validity and reliability. Three questions asked about participants' concerns for self-exposure, getting, and giving HIV/AIDS to someone else. Each question was measured on a 4-point Likert scale (*strongly disagree, disagree, agree, strongly agree*) and a higher summated total score represented a higher participants' concern for HIV/AIDS. Participants were also asked one question on whether they were interested in changing things to help avoid getting HIV/AIDS. For engaging in risk behaviors, participants had two questions: When engaging in sexual activity, how often they used a latex condom for a consistent protection (*never, sometimes, always*), and then, how often, they injected drugs (*never, 1, 2 times, 3 or more times*). A higher summated total score denoted participants' higher engagement in risk behaviors.

*Attitudinal stigma on HIV/AIDS* was measured with a standardized scale (Beaulieu et al., 2014), using all 23 questions on a 4-point Likert format (*strongly disagree, disagree, agree, strongly agree*). A higher summated total score represented a higher stigmatizing attitude. The scale has acceptable validity and reliability, and is composed of five factors, two of which (6 items) focus on individual prejudices regarding personal contact with HIV/AIDS, and three factors (17 items) that focus on stereotyping attitudes (judgment, cultural/moral views, and acceptance) toward those with HIV/AIDS.

## Analysis

All quantitative data were entered into a Statistical Package for Social Sciences (SPSS) software, v. 24. Measures of central tendency and variability provided descriptive information, and bivariate measures for nonrandomly selected samples examined variable relationships. The multiple regression analysis was used to examine the impact of more than one antecedent variable upon two outcome behaviors such as when engaging in risky behaviors or stigmatizing attitudes, as statistical regression is useful for gaining insight into multivariate relationships (Field, 2018). The statistical significance for variable relationships was set at  $p < .05$ . The Cronbach's alpha provided the reliability of the main measures, and a coefficient of 0.70 or higher was used for the demarcation of adequate internal consistency in measures (Field, 2018).

## Results

Originally from Ethiopia, over one-half ( $n = 33$ , 55%) of the study participants have been in the U.S. for more than 5 years. Their ages ranged from 24 to 64 years, with an average age of 38 years. The majority ( $n = 58$ , 96%) were Christian. Thirty-nine (65%) self-identified as male and 21 (35%) as

female. All but one participant reported being heterosexual. Thirty-five (58%) were married, 16 (27%) single, and 9 (15%) were separated, divorced, or widowed. Over two-thirds (n = 41, 68%) worked full time, 16 (27%) part-time formally or informally, and only 3 were unemployed. The participants represented an educated group, with 25 (42%) having an undergraduate degree, 17 (28%), a graduate degree, and all could read, speak, and understand English. While many (n = 41, 68%) spoke Amharic at home, 5 were bilingual in English/Amharic, and 13 (22%) spoke another primary language as well (for additional details, see Oliphant & Donaldson, 2019).

To explore individual variable relationships for participants' total scores on knowledge of HIV/AIDS, concerns, risk behaviors, and attitudinal stigma and selected demographics, bivariate correlations are provided in Table 1.

Examining participants' knowledge of HIV/AIDS revealed that most (n = 51, 85%) provided correct responses for 8–10 questions and 9 (15%) for 2–7 questions. However, 10% held inaccurate beliefs on six areas (items 1–5 and 10) and 8% on one area (item 7) out of the 10 areas of knowledge. Although these participants had at least 80% accuracy in their knowledge of HIV/AIDS transmission, around 15% held inaccurate beliefs, as shown in Table 2.

**Table 1.** Bivariate correlations between variables for study participants (N = 60).

Variables		1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Knowledge Total score	rho†	1.00								
2. Age	rho	0.01	1.00							
3. Gender Male = 0	rho	-0.05	-0.33**	1.00						
4. Education	rho	0.32**	0.17	-0.10	1.00					
5. Time U.S.	rho	0.10	0.31**	-0.04	-0.24	1.00				
6. Behavior Risk Total score	rho	0.01	-0.07	0.25	0.29*	0.13	1.00			
7. Concern Total score	rho	0.00	0.08	-0.07	-0.17	-0.01	0.01	1.00		
8. Wanted Change behavior	rho	-0.07	-0.01	-0.15	0.01	-0.04	0.02	0.33**	1.00	
9. Stigma Total score	rho	-0.30*	-0.05	-0.03	-0.40**	-0.04	-0.07	0.21	0.10	1.00

\* Statistical significance p < .05, \*\*p < .01, †Spearman rho correlation coefficient for nonrandomly selected samples

**Table 2.** Participants' knowledge of HIV/AIDS transmission (N = 60).

Knowledge Question	Correct Answer	Correct Responses n (%)	Incorrect Responses n (%)
1. Coughing and sneezing do not spread HIV.	True	50 (83%)	10 (17%)
2. All pregnant women infected with HIV will have babies born with AIDS.	False	41 (68%)	19 (32%)
3. People who have been infected with HIV quickly show signs of being infected.	False	52 (87%)	8 (13%)
4. A person can get HIV from oral sex.	True	48 (80%)	12 (20%)
5. A woman can get HIV if she has anal sex with a man.	True	52 (87%)	8 (13%)
6. HIV is transmitted by vaginal intercourse.	True	57 (95%)	3 (5%)
7. A man can get HIV if he has anal sex with another man.	True	55 (92%)	5 (8%)
8. You can protect yourself from HIV/Aids by using a condom during sexual intercourse.	True	59 (98%)	1 (2%)
9. HIV/Aids is transmissible by needle sharing.	True	58 (97%)	2 (3%)
10. You can protect yourself from HIV/Aids by using single needles and syringes.	True	54 (90%)	6 (10%)

Of the 10 possible correct responses, minimum score = 2, maximum = 10, Mean = 8.76 (SD = 1.50); 9 (15%) participants had 2–7 correct responses and 51 (85%) had 8–10 correct responses. The reliability for the total scale had Cronbach's alpha of 0.60.

**Table 3.** Participants engagement in condom protection (N = 60).

Variables	Using Condom Protection	
	Never/Sometimes 51(85%)	Always 9 (15%)
Inject Drugs	46 (90.2%)	9 (100%)
Never		
Sometimes/Often	5 (9.8%)	0 (0.0%)
Marital Status**	18 (35.3%)	7 (77.8%)
Single <sup>a</sup>		
Married	33 (64.7%)	2 (22.2%)
Gender	31 (60.8%)	8 (88.9%)
Male		
Female	20 (39.2%)	1 (11.1%)
Time in US	23 (45.1%)	4 (44.4%)
<5 years		
5 yrs or more	28 (54.9%)	5 (55.6%)
Education**†	7 (13.7%)	4 (44.4%)
Lower <sup>b</sup>		
Higher <sup>c</sup>	44 (86.3%)	5 (55.6%)

\* <0.05, \*\*p < 0.01, <sup>a</sup>Single, separated, divorced, widowed; <sup>b</sup><High school, High school, or post High school technical school certification; <sup>c</sup>Some college, college degree, or graduate ed.; †In Chi-square 3-way analysis for Education, we controlled marital status, Total Pearson Chi-square (df = 1) = 4.82, p = 0.022, Total Effect Phi = 0.28, Effect for Single marital status: Phi = 0.46, and Effect for Married: Phi = 0.20, with Mantel–Haenszel Chi-square (df = 1) = 3.86, p = 0.05, and Cochran's Chi-square (df = 1) = 6.28, p = 0.01. Common odds ratio estimate for not using protection with higher education, when controlling for marital status = 8.5.

Examining risky behaviors revealed that five (8%) participants injected drugs, while they did not use condom protection consistently, or always. Of these five participants, one identified as single and four as married. [Table 3](#) shows the use of condoms as a protection during sex in relation to participants' selected characteristics. As marital status and education were implicated with condom use, we conducted 3-way Chi-square analysis. Controlling for marital status, participants condom use was significantly ( $p < .05$ ) associated with education. However, those who did not use condom protection consistently, were much more likely to have higher education (with some college courses or more). Further, multiple regression analysis also revealed that around 30% (R-square = 0.30, Adj. R-square = 0.28) of participants' total behavioral risk was explained by their education ( $b = 0.68$ ,  $SE = 0.24$ , R-square change = 0.08, Beta = 0.31) and by their marital status ( $b = 0.80$ ,  $SE = 0.19$ , R-square change = 0.22, Beta = 0.47) (Constant = 1.31,  $SE = 0.25$ ;  $F(2, 57) = 12.19$  at  $p < .001$ ).

Examining concerns about HIV/AIDS ([Table 4](#)) revealed that only very few were concerned about giving HIV/AIDS to someone else ( $n = 5$ , 8%), while some ( $n = 10$ , 17%) were concerned about being exposed, and some ( $n = 20$ , 33%), about actually getting HIV/AIDS. Although 22 (37%) denied having any concerns, 26 (43%) admitted mild concerns, and 12 (20%) moderate-high concerns, over one-half ( $n = 32$ , 53%) reported an interest in wanting to change things in their life to avoid getting HIV/AIDS.

Examining stigmatizing attitudes toward those with HIV/AIDS revealed a total score stigmatization Mean = 22.77 (SD = 8.78, minimum score = 5, maximum score = 45). Nine (15%) participants had a very low stigmatization score (5–13), 21 (35%) had a fairly low score (14–23), but 50% had moderate stigmatization (24–45). [Table 5](#) describes stigmatizing attitudes on separate areas, revealing that most stigmatizations occurred in participants' struggles with sharing space, lacking acceptance for others,

**Table 4.** Concerns of participants regarding HIV/AIDS (N = 60).

Type of concern	Concerned n (%)
Self-exposure	10 (17%)
Getting HIV/AIDS	20 (33%)
Giving HIV/AIDS to others	5 (8%)
Amount of total concern regarding HIV/AIDS for 3 concerns	
No Concerns (Total score = 0)	22 (37%)
Mild Concerns (Total score = 1–3)	26 (43%)
Moderate Concerns (Total score = 4–6)	11 (18%)
High Concerns (Total score = 7)	1 (2%)

The reliability of the three items on the total concern scale had Cronbach’s alpha of 0.65.

**Table 5.** Participants with and without stigmatizing attitudes on HIV/AIDS (N = 60).

Attitudinal areas of stigma toward others with HIV/AIDS	With Stigma Attitudes n (%)	Without Stigma Attitudes n (%)
<i>Factor 1: Sharing Space</i> (3 items)	15 (25%)	45 (75%)
<ul style="list-style-type: none"> <li>● Being around someone who has HIV/AIDS does not bother me.</li> <li>● I would not be worried for my health if a coworker had HIV/AIDS.</li> </ul>		
<i>Factor 2: Personal Contact</i> (3 items)	8 (13%)	52 (87%)
<ul style="list-style-type: none"> <li>● I would limit my contact with a person with HIV/AIDS.</li> <li>● I would not hug someone with HIV/AIDS.</li> </ul>		
<i>Factor 3: Judgment Toward Individuals</i> (6 items)	34 (57%)	26 (43%)
<ul style="list-style-type: none"> <li>● People who inject drugs deserve to have HIV/AIDS.</li> <li>● People who are infected with HIV/AIDS get what they deserve.</li> </ul>		
<i>Factor 4: Cultural/Moral Views</i> (4 items)	49 (82%)	11 (18%)
<ul style="list-style-type: none"> <li>● To fight HIV/AIDS, it is necessary that young people not have sex.</li> <li>● The spread of HIV/AIDS is linked to decline of moral values.</li> </ul>		
<i>Factor 5: Accepting Attitudes</i> (7 items)	22 (37%)	38 (63%)
<ul style="list-style-type: none"> <li>● People with HIV/AIDS should have a right to work serving the public.</li> <li>● Children infected with HIV/AIDS should be able to go to daycare.</li> </ul>		

The reliability of the scale had Cronbach’s alpha of 0.83.

and being judgmental or moralistic toward those with HIV/AIDS. Multiple regression analysis revealed that only level of education, and not a level of knowledge of HIV/AIDS, or risky behaviors, concerns or demographics, significantly contributed to participants’ stigmatizing attitudes (Constant = 29.68,  $b = -1.97$ ,  $SE = 0.65$ ) ( $Beta = -0.37$ ;  $F(1,58) = 9.16$ ,  $p < .004$ ;  $R\text{-Square} = 0.14$ ,  $Adj. R\text{-Square} = 0.12$ ).

## Discussion

This community-based study adds to the limited information on the knowledge, behaviors, and attitudes of adult Ethiopian immigrants toward HIV/AIDS, and particularly of those who live in the D.C. metro area. The sampled Ethiopian immigrants were well educated, as has been noted about African immigrants in the District (Institute for Immigration Research-George Mason University, 2019). Hence, it is notable that a substantial number of the surveyed Ethiopian participants provided incorrect responses to half of the items related to HIV/AIDS transmission. In addition, although 60% of the surveyed Ethiopian adults held at least a college degree, one-half of them engaged in risky behaviors. In fact, those with more education reported engaging in more risky behaviors for contracting HIV/AIDS. These findings are also supportive of previous research, indicating that although participants may have higher levels of education, or even well understand the main modes of HIV transmission, they can also simultaneously hold many misconceptions about HIV transmission (Foley, 2005) and not accurately estimate their behavioral risk (Akinsulure-Smith, 2014). Other research has



also shown that having higher education, by itself, is not necessarily protective against misconceptions about risky sexual behaviors and HIV transmission. For example, Murray et al. (2014) found that African American college students with higher levels of education had multiple and various misperceptions about consequences of sexual behaviors or HIV transmission, including reluctance to ask questions of their partner.

Cultural issues may also offer insight into this study's finding that higher education and knowledge do not fully protect against risk behaviors. Wafula and Snipes (2014) emphasized that when working with African immigrants who are more likely to distrust health care professionals, it is crucial for prevention and treatment efforts to incorporate cultural knowledge and sensitivity to traditional health care beliefs, as well as engage known and trusted community brokers or leaders who can help to mitigate misconceptions about HIV/AIDS, and thus reduce mistrust, fear, or stigma. More recently, Nevin et al. (2018) recommended that professionals adopt an HIV-adapted biopsychosocial model, as a way to more competently and sensitively address how HIV-stigma manifests and impacts HIV-related health, morbidity, mortality, and transmission in different African immigrant communities in the U.S.

These findings are also concerning in light of the recent annual surveillance data in the District, which noted that the number of men newly diagnosed with HIV attributable to injection drug use has increased for the first time in 10 years, from 2 cases reported in 2017 to 7 cases in 2018 (2021). Additionally, the modes of HIV transmission reported in the HASTA reports (2019, 2020, 2021), for Black males (with 2018–2019–2020 data), have shown continuation of risky behaviors with male on male sex (53.1%, 54.3%, 55.7%), injection drug use (10.1%, 9.5%, 9.5%), male sex with injection drug use (5.7%, 5.7%, 5.7%), and hetero-sex (17.8%, 17.5%, 17.6%). For Black females, within the same three data years, hetero-sex continues to be risky for HIV transmission (65.0%, 65.7%, 67.3%), along with drug injection use (17.3%, 16.8%, 18.8%). Therefore, these findings point to the need for further research on how individuals translate their beliefs into actionable behaviors, and also on more in-depth exploration of such behaviors when developing community-based interventions.

Further, although a large number of participants had no or mild concerns related to contracting HIV/AIDS, their levels of stigmatizing attitudes were fairly high, especially those attitudes related to blaming people with HIV/AIDS for their condition and linking rates of HIV infection to a decline in moral values. In fact, one-half of the study participants had moderately stigmatizing attitudes toward others with HIV/AIDS. These results are concerning, as Rueda et al. (2016) showed with 64 studies that moderate HIV-related stigma can increase rates of adult depression, and lower social support, or adherence to medications or treatment, lower access to the use of health and social services, and that even weaker stigma may contribute to individuals' anxiety, quality of life, physical health, emotional and mental distress, and sexual risk practices. Findings from the current study suggest that perceptions of HIV-related stigma may continue to present a substantial challenge to HIV prevention, testing, and treatment efforts in the local Ethiopian community. Similar to other studies, this study also found individual associations between stigmatizing attitudes and knowledge on HIV/AIDS (Berkley-Patton et al., 2013), and lower education (Coleman et al., 2016; Galvan et al., 2008; Kerr et al., 2014). However, when multivariate examination was applied, only education was statistically significantly able to suggest that a possible relationship with participants' level of stigmatization exists.

Further, contrary to general expectations, this study found that more educated individuals took more risks in activities that are known to increase chances for contracting the HIV virus. It is unclear whether such behavior may signal potential recklessness (De Jesus et al., 2016), hopelessness (Mota et al., 2019), or something else, and needs further research. This study found no associations between stigma and gender, or age of participants, although such has been previously reported (Lindley et al., 2010).

This study also raises several social work practice implications. First, although contemporary HIV/AIDS practice methods are primarily focused on using one-pill-per-day regimen or Preexposure Prophylaxis for the Prevention (PrEP) of HIV for preventing infection, these efforts have been hampered in a similar way to the findings in the current study, by lack of individual awareness,

knowledge, or stigmatization of HIV (Dean et al., 2021). Therefore, Ethiopian micro-communities in the U.S. (e.g., Ethiopian diaspora) may require that any interventions be first more associated with the early AIDS-epidemic strategies, such as raising awareness, building knowledge, and reducing stigma through education, as a bridge to engagement in testing, treatment as general preventative strategies, with PrEP used as needed for high-risk community members. Second, as the majority of participants reported belonging to a Christian religion, social workers may want to partner with and engage faith-based or spiritually oriented leaders from Ethiopian churches and mental health communities on education and promotion efforts to decrease stigma and build knowledge around HIV/AIDS. Churches and community clinics can be good sites for health fairs with HIV education, testing, and prevention efforts, including PrEP uptake. Lastly, as people living with HIV often encounter intersectional stigmas related to societal power structures, legal frameworks, and intersecting prejudices experienced by many of the sub-populations disproportionately affected by HIV (Turan et al., 2019), social workers also need to become familiar with types of HIV-related stigma interventions and their success with different populations and continue to build new interventions on empirically and theoretically supported models for reducing stigma (Birbeck et al., 2019).

### ***Study limitations and recommendations for future research***

This study is limited by a small, self-selected sample that may not be representative of the wider Ethiopian community needs regarding HIV/AIDS in the DC metro area. Although the small sample size was reasonably adequate for the regression analyses, such findings should be viewed with caution, as the sample size only had barely 80% power to detect only moderate effects in power analysis with G\*Power software (Faul et al., 2009). Findings from this cross-sectional and correlation study preclude drawing any causal results. Of the measures, only the stigma scale demonstrated an adequate Cronbach's alpha reliability. The reliabilities of other measures were reasonable, given the fact that answers were collected in community encounters and were of sensitive nature, as both of these issues may have reduced consistency in participants' responses. The measurement of participants' risky sexual activity also does not include information on other emerging associated factors, such as whether participants were strictly monogamous or engaged with multiple partners or in sexual mixing (Ogunjimi, 2017), whether they engaged in recreational drug or alcohol use, or experienced housing or immigration status instability (Sandfort et al., 2017), or whether they experienced pre- or post-migratory depression or trauma (Ogunbajo et al., 2019; Sabri, 2018). Overall, the study could not fully control participants' reactivity, despite precautions taken with using a systematic de-identified data collection survey guide, careful training of the interviewers, and not using participants' names during the interview. Future research should attempt an epidemiological study, while stratifying for education and gender of different at-risk subgroups, as such knowledge would offer a more accurate prevalence of HIV/AIDS among the Ethiopian population groups within the U.S.

Overall, this study findings reinforce the observation that despite participants' knowledge about HIV/AIDS, misconceptions, risky behaviors, and stigmatization of others with HIV/AIDS, may create barriers to prevention or treatment engagement. Because participants' higher levels of education seemed helpful in reducing stigma, but did not suggest that participants were better protected against risk behaviors, more research is needed with larger and better powered samples of Ethiopian individuals in the U.S., which would allow for multivariate examination of participants' wider range of beliefs and behaviors. Future research should also examine and test the effectiveness of specific intervention strategies designed to reduce HIV/AIDS-related stigma among the Ethiopian community, including those with higher levels of education and engagement in risk behaviors as well. Research that uses population centered collaborative strategies with targeted communities is highly recommended, to ensure that such projects are culturally sensitive, and meaningful to the Ethiopian local or national community.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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