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RISK PERCEPTION AND BELIEFS REGARDING HIV INFECTION AMONG ETHIOPIAN IMMIGRANTS

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In Ethiopia, approximately 7.5% of the urban population is HIV-positive, and countrywide 1.5 million people are living with HIV. Between 1990 and 2000, immigration into the United States by African-born immigrants increased by 130%. Of this immigrant population, individuals from Ethiopia make up a significant portion. Although there is a rich literature addressing the beliefs regarding HIV and risk perception among some immigrant populations in the United States, few studies target Ethiopian-born residents. Thus, a survey-based study addressing demographics, acculturation, awareness, beliefs and risk perception, attitudes toward susceptibility for infection, and risk behaviors targeted Ethiopian-born residents of San Diego, California. Results indicate a separation between understanding of HIV transmission and personal risk perception for infection in a young, highly educated, predominantly male participant pool. As an initial study of HIV beliefs and risk perception in the immigrant Ethiopian population, our results provide information on specific areas warranting further investigation.

BACKGROUND

The study of HIV risk perception among immigrant groups is essential, as it may profoundly affect the population's susceptibility to HIV infection (Shedlin, et al., 2006; Singh & Siahpush, 2002). A recent study by Kerani et al. (2008) reported that African-born individuals residing in the United States accounted for 3.8% of the

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HIV diagnoses between 2003 and 2004. Fifty-six percent of African-born residents arrived in the United States between 1990 and 2000 (Grieco, 2004). Of approximately 1 million African-born residents in the United States, about 10% are from Ethiopia. In Ethiopia an estimated 1.5 million people are living with HIV (UNAIDS, 2008). Thus, the impact of Ethiopian immigration on the epidemiological picture of HIV in some areas may be significant (Kerani et al., 2008). Moreover, beliefs and risk perception held by this population regarding HIV will play an important role in prevention.

Previous studies conducted in Ethiopia indicate that although 80% of the native population believed that HIV transmission was preventable, only a small fraction had taken measures to protect themselves against infection (United Management Consultants, 2000). In addition, 50% of the respondents believed that ordinary people could contract HIV, yet only 25% believed that they individually could become infected (United Management Consultants, 2000). Other studies focusing on groups in Ethiopia with high-risk sexual behaviors, such as those having recent casual partners or multiple lifetime partners, also found these individuals to consider themselves at low risk for infection (Sahlu, et al., 1999). A more recent study conducted in Ethiopia that included nearly 5,000 single youth between the ages of 15 and 24 indicated that high-risk sexual behavior was common among participants (Wouhabe, 2007). Likewise, studies among adolescents in a rural region of northwestern Ethiopia reported that although aware of the risk of HIV infection, only about 40% of the participants could correctly identify modes of transmission (Alene, Wheeler, & Grosskurth, 2004). Another study, also aimed at gauging the levels of awareness among people in Addis Ababa, reported that of the 2,278 individuals interviewed, a significant number had negative attitudes toward HIV/AIDS patients and only 5.5% believed that the life span of an HIV infected person could be prolonged with proper management (Yerdaw, Nedi, & Enquoselassie, 2002). These studies highlight the importance of evaluating beliefs regarding HIV infection, prevention, and risk perception in the Ethiopian immigrant population.

Extensive studies have been conducted regarding knowledge of HIV and perceived risk perception among some immigrant populations residing in the United States (Chakraborty, Purohit, Shah, & Kalla, 1996; Kennedy & Van Houten, 1992; Loue & Oppenheim, 1994; Thamer, Richard, Casebeer, & Ray, 1997). For example, one study conducted to assess the awareness of HIV/AIDS among 34 Indian college students aged 18-26 years who migrated to the United States found that 3% believed that HIV was curable, 53% felt that their knowledge regarding HIV was inadequate, and 79% believed that individuals in India do not have adequate knowledge about HIV/AIDS (Chakraborty et al., 1996). However, little information exists regarding Ethiopian-born individuals residing in the United States. One study, conducted in 2000, which included 40 Ethiopian and Eritrean immigrants living in California, reported that most participants underestimated their risk for infection and held similar attitudes and beliefs regarding HIV to those reported in their country of origin (Beyene, 2000). Several studies aimed at Ethiopian immigrants have considered populations in Israel (Kaplan, Soskolne, Adler, Leventhal, & Shtarkshall, 2002; Soskolne & Shtarkshall, 2002). An extensive study by Soskolne and Shtarkshall addressing migration and HIV programs, report an increased rate of HIV (7.6%) among recently arrived (since 1991) Ethiopians to Israel (Soskolne & Shtarkshall, 2002). Thus, as a starting point to address beliefs regarding HIV infection, prevention and risk perception among Ethiopians living in the United States, we conducted a survey-based

study targeting Ethiopian-born residents living in San Diego, California, where a large Ethiopian community resides.

METHODS

This study sought to represent the diverse Ethiopian population in San Diego, encompassing major socioeconomic, cultural, and age groups. Following institutional review board approval from the University of California-San Diego, this study was designed to target Ethiopians over the age of 18 living in San Diego. From 2005 to 2007, only 84 of approximately 400 individuals approached for participation in this study agreed to participate. Participants were recruited at local cultural, religious and outreach events with the help of Ethiopian community liaisons. To recruit subjects, a booth was set up at each event with information related to HIV in Ethiopia and the United States and community resources available for testing, counseling, and treatment. Participants that visited the booth were informed of our study objectives and invited to participate. Individuals wishing to participate were informed about the study design, questionnaire and objectives by one of the authors listed on this manuscript and were asked to give written informed consent to participate. A five-part questionnaire consisting of 74 questions was developed to address (a) demographics (gender, age, place of birth, marital status, education level, etc.), (b) level of acculturation (questions are based on previously reported short acculturation measures (dela Cruz, Padilla, & Agustin, 2000; Kasirye et al., 2005; Lin, Simoni, & Zemon, 2005), (c) awareness and risk perception, (d) attitudes toward demographic susceptibility for infection, and (e) lifestyle and risk behaviors. The questionnaire, originally written in English, was translated into Amharic, the official language of Ethiopia. Multiple Amharic-speaking Ethiopians reviewed the questionnaire for translational clarity and cultural relevance. The questions and format for the survey were based on previously published studies conducted in rural and urban Ethiopia (Alene et al., 2004; Ashebir, 1996; Getnet, 2005; Wouhabe, 2007; Yerdaw, et al., 2002) and with African immigrants living in the United States and Israel (Beyene, 2000; Burns, Imrie, Nazroo, Johnson, & Fenton, 2007; Harawa, Bingham, Cochran, Greenland, & Cunningham, 2002; Kerani et al., 2008; Rosenthal, et al., 2003; Soskolne & Shtarkshall, 2002).

To ensure participant anonymity, questionnaires were numbered and had no markers to identify the participant. Amharic, Oromo, and Tigrigna are the three most common languages spoken in Ethiopia, with approximately 60% Amharic, 30% Oromo, and 5-10% Tigrigna. Thus, participants had access to trained administrators who spoke Amharic, Oromo, and Tigrigna, to clarify issues regarding the questionnaire if needed. For privacy, participants completed the survey at stations set up near the information booth. After self-administration of the questionnaire, participants were directed to place the completed survey through a slot into sealed box. Analyses of completed surveys were then carried out at a later date in an anonymous manner. Descriptive analyses of frequency and characteristics of responses to the questionnaire were entered into Microsoft Excel based on the number of respondents for each question. The percentages for a given answer were calculated based on the total number of responses to each question. Interquartile range (IQR) was calculated as the difference between the first and third quartiles for a range of values. Responses that were unclear or incomplete were not counted.

TABLE 1.

Mean age in years (n = 81)	29.5 (IQR: 24)
	N (%)
Place of Birth (n = 64)	
United States	3 (4.7)
Country other than United States or Ethiopia	2 (3.3)
Ethiopia (n = 59)	59 (92)
Addis Ababa, Ethiopia	33 (56)
Outside Addis Ababa in Ethiopia	3 (5)
Was the United States your first home after Ethiopia (n = 66)	
Yes	59 (89)
No	7 (11)
Mean number of years since emigration from Ethiopia	12
Gender (n = 75)	
Male	55 (73)
Female	20 (27)
Marital status (n = 78)	
Never married	50 (64)
Married	19 (24.4)
Divorced/Separated	6 (7.7)
Widow	0 (0)
Other	3 (3.9)
Number of Children (n = 74)	
0	56 (75.6)
1 Child	9 (12)
More than 1 child	9 (12)
Highest educational status (n = 77)	
1-6 years	1 (1.3)
Some high school education	11 (14.7)
Some college or beyond	65 (84)

RESULTS

RECRUITMENT AND DEMOGRAPHICS

Of the 84 participants, the median age of this group was 29.5 years (IQR: 24 years) (Table 1). Ninety-two percent of the responding participants reported Ethiopia as their birthplace, and on average, left Ethiopia 12 years prior, highlighting the recent arrival of this study group to the United States. Eighty-nine percent of participants emigrated from Ethiopia directly to the United States. The majority of participants had never been married (64%) and did not have children (75.6%). The educational status of the participants was relatively high, with 84% reporting at least some college education (see Table 1).

ACCULTURATION MEASURES

In accordance with the recent immigration of this population and based on results from similar studies with different immigrant populations (de la Cruz et al., 2000; Lin, Simoni, & Zemon, 2005; Soskolne & Shtarkshall, 2002), the level of acculturation was somewhat limited. Eight-nine percent of the subjects reported an Ethiopian language (Amharic, 72%, Tigrigna 4%) as their primary language at home (Table 2). Twelve percent of subjects reported using English in equal frequency to an Ethiopian language, and another 12% reported English as their primary language. In addition, 73.5% of subjects described their ethnic identity as Ethiopian and 25% as Ethiopian American. The majority of subjects (74%) reported Ethiopian customs as very important to their way of life, and 23.5% reported these customs to be at least somewhat important. In terms of daily interactions, 35% interacted with only

TABLE 2.

	N (%)
First language was an Ethiopian-based language* (*n* = 84)	75 (84)
Primary language (*n* = 83)	
English	10 (12)
Amharic	60 (72.3)
English + Ethiopian language equally	10 (12)
Tigriana	3 (3.7)
Ethnic identification (*n* = 80)	
American	1 (1.25)
Ethiopian	60 (73.5)
Ethiopian American	20 (25)
Ethiopian Eritrean	1 (1.25)
Importance of Ethiopian customs (*n* = 81)	
Very important	60 (74)
Somewhat important	19 (23.5)
Not Important	2 (2.5)
Daily Interactions (*n* = 79)	
American	21 (26.6)
Ethiopians	28 (35.4)
Americans and Ethiopians equally	30 (38)

*Ethiopian based language = Amharic, Tigriana, Oromitta, and Arabic.

Ethiopians. It should be noted that although based on previously described questionnaires used to study acculturation, extensive analyses of an Ethiopian-specific acculturation scale have not been conducted as have been with several other immigrant groups (Coronado, Thompson, McLerran, Schwartz, & Koepsell, 2005; dela Cruz, Padilla, & Butts, 1998; Kasirye et al., 2005).

BELIEFS REGARDING HIV/AIDS

Beliefs regarding HIV among participants were addressed by questions addressing HIV transmission and prevention. The vast majority of the group (95%) had heard of HIV by at least age 10 and 66% reported Ethiopia as the country in which they learned about HIV (Table 3). Regardless of the country in which participants learned about HIV, the media contributed significantly as a source for HIV information, ranging as a source from 49% to 71%, depending on the specific type of media. Additionally, information from health care professionals (41%), family members (38%) or school (57%) contributed significantly as sources for HIV knowledge.

Although a significant percentage of participants believed that HIV could be fatal (84%), 32% believed that it could be cured (see Table 3). Ninety-eight percent believed that HIV was a preventable illness and all of the participants planned to educate their children about HIV. The majority of participants (95%) reported that HIV could be passed from person to person, regardless of gender (89%). Participants were next asked to identify practices to prevent HIV infection. When provided a list of twelve options, three of which could prevent HIV infection (staying with one faithful partner, using condoms during intercourse, or avoiding needle sharing), 100% of subjects chose at least one effective practice. However, only 22% of subjects could pick out all three correct practices for HIV prevention. In contrast, 67%

TABLE 3. Socioeconomic Factors Contributing to HIV Infection

	N (%)
Are Africans are more likely to get infected than other people? (*n* = 82)	
Yes	54 (66)
No	28 (34)
If yes, why are they more likely to be infected?	
Lack of education or prevention services (*n* = 43)	22 (51.2)
Other reasons	21 (48.8)
Which Ethiopian age groups are most infected by HIV? (*n* = 82)	
Children	24 (29)
Adolescents	58 (70)
Middle-aged adults	47 (57)
Elderly	6 (7)
Which USA age groups are most infected by HIV? (*n* = 83)	
Children	9 (11)
Adolescents	61 (74.4)
Middle-aged adults	42 (50.2)
Elderly	1 (1.2)
Is HIV a serious problem in Ethiopia? (*n* = 82)	
Not serious	1 (1.2)
Minimally serious	3 (3.7)
Serious	11 (13.4)
Very serious	67 (81.7)
What percentages of people are infected in Ethiopia? (*n* = 76)	
Less than 1%	2 (2.6)
1-5%	6 (7.8)
5-10%	12 (16)
10-20%	24 (31.6)
20-40%	22 (29)
More than 50%	10 (13)
Is HIV a serious problem in USA? (*n* = 80)	
Not serious	5 (6.25)
Minimally serious	27 (33.75)
Serious	25 (31.25)
Very serious	23 (28.57)
What percentages of people are infected in the USA? (*n* = 74)	
Less than 1%	20 (27)
1-5%	18 (24.3)
5-10%	13 (17.6)
10-20%	16 (21.6)
20-40%	5 (6.8)
More than 50%	2 (2.7)
Are thin people more at risk for infection? (*n* = 79)	
Yes	6 (7.6)
No	73 (92.4)
Can you tell by looking at someone if they have HIV? (*n* = 78)	
Yes	2 (2.6)
No	76 (97.4)
Does money play a role in HIV risk? (*n* = 70)	
Yes	8 (11.4)
No	62 (88.6)
Are poor or rich people more easily infected? (*n* = 76)	
Rich	2 (2.6)
Poor	16 (21.2)
Neither	58 (76.2)

of subjects chose an ineffective practice (e.g., good diet). In addition, a large proportion of participants believed that habits such as smoking cigarettes (10%), drinking alcohol (17%) or using drugs (46%) could contribute to HIV infection. Whether participants believed that these habits could contribute directly to infection or to increased risk behaviors is unknown. Eighteen percent of participants reported that

TABLE 4. High-Risk Behaviors and Risk Perception

	N (%)
Do you know anyone with HIV (*n* = 78)	
Yes	34 (43.6)
No	44 (56.4)
Do you believe that you may get HIV (*n* = 77)	
Not possible	28 (36.4)
Not likely	34 (44.1)
Maybe	12 (15.6)
Likely	3 (2.6)
Highly likely	1 (1.3)
Do you use condoms (*n* = 75)	
Never	9 (12)
Sometimes	21 (28)
Always	45 (60)
Current number of sexual partners (*n* = 76)	
0	17 (22.4)
1	46 (66.6)
At least 2 partners	14 (18)
Total number of lifetime sexual partners (*n* = 68)	
0	8 (11.8)
1	14 (20.5)
2	5 (7.4)
3	8 (11.8)
4	2 (2.9)
At least 5 partners	31 (45.6)
Do you believe you have HIV? (*n* = 79)	
Yes	1 (1.3)
No	78 (98.7)

mosquito bites could lead to HIV infection. Thus, results provide a starting point from which to identify specific issues regarding HIV prevention in the Ethiopian immigrant population in the United States.

SOCIOECONOMIC FACTORS AND HIV

Two thirds of participants believed that Africans were "more likely" to become infected with HIV than other individuals (Table 4). When asked to describe in a few sentences why they believed that Africans were more likely to become infected, 50% listed socioeconomic factors, such as lack of education and access to preventive services may contribute to their beliefs. The majority of subjects (> 76 %) did not perceive that certain characteristics, such as weight or affluence, affected the risk for HIV infection. Likewise, over 97% did not believe that HIV-positive individuals had a certain appearance that distinguished them from uninfected individuals. The study population perceived adolescents, followed by middle-aged adults, as the age group with the highest rates of HIV infections in both the United States and Ethiopia. Twenty-nine percent of the study participants believed that Ethiopian children were the group with the most infections whereas 11% believed that American children were the group with the most infections. The majority of participants, 82%, believed that HIV was a "very serious" problem in Ethiopia, although only 29% considered it a "very serious" problem in the United States. When asked to estimate the prevalence of HIV in Ethiopia, the majority (about 60%) of participants believed that 10-40% of Ethiopians were HIV-positive. This was much higher than their estimates for the U.S. population, where 51% of participants believed that on average 0-5% of the population was infected (see Table 4).

HIGH-RISK BEHAVIORS AND RISK PERCEPTION

In terms of personal risk perception, the majority of participants believed they were at low risk for HIV infection (Table 5). Over 80% considered it "not possible" or "not likely" for them to become infected with HIV. However, 40% reported that they did not use condoms regularly during sexual intercourse. Moreover, 18% reported having at least two sexual partners currently. Almost one half of the study population, 46%, reported having at least five sexual partners in their lifetimes (see Table 5). Only one person reported that s/he was infected with HIV.

A final section of the questionnaire targeted subjects who believed they had HIV and dealt with changes in high-risk behaviors after a presumptive or official diagnosis. However, there were no respondents to this section.

DISCUSSION

Results from this exploratory assessment of beliefs about HIV infection, prevention, and risk perception among the immigrant Ethiopian population living in San Diego reveal several interesting findings including a separation between understanding of HIV transmission and personal risk perception for infection in a young, highly educated, predominantly male participant pool. Several limitations of the study were recognized and discussed below. Areas warranting further investigation are addressed as well.

Three main limitations of the study are recognized. First, participation was very low with only about 20% of those recruited actually participating. Second, 73% of the participants were male. A third limitation of the study was that participants did not answer all questions on the survey. For example, the question regarding place of birth was answered by 64 of 84 (76%) participants responding (see Table 1).

As illustrated by the low rates of recruitment to the study (only 84 out of 400, 21%), significant work is needed to promote participation in HIV research and to understand barriers to participation. Although no data were collected regarding the reasons for declining to participate in the survey, the large number of people approached in relation to those willing to participate may reflect disinclination among Ethiopians immigrants to discuss HIV/AIDS. The demographic composition of the group was primarily single, young (29.5 years), well-educated (college-level) males. Although the events at which participants were recruited included individuals from a wide age range, and a fairly even ratio of males to females, only 27% of the participants were female. Whether the composition of the group reflects reluctance among females and older individuals to participate owing to the HIV-themed topic or other reasons is unknown, but this result clearly represents an area for further investigation. Numerous studies in rural Ethiopia report that women are significantly less likely to participate in HIV related projects than their male counterparts (Cummings, Mengistu, Negash, Bekele, & Ghile, 2006). Although the age, gender and education level bias somewhat limits the applicability of the results to the general Ethiopian immigrant population, to our knowledge, few studies exist that target this population (Beyene, 2000). On the other hand, it is also possible that individuals simply did not want to spend time to answer questions because social activities were being conducted during recruitment.

Programs aimed at minimizing the stigma associated with HIV may help to open a dialogue within the Ethiopian community in the United States and, by extension, increase research participation. Moreover, further studies designed to recruit

different subsets, such as older individuals, women, HIV-positive individuals and broader educational representation are critical in establishing effective outreach and preventive programs for the immigrant Ethiopian population.

Despite the study population's high educational status, the majority of subjects held misconceptions about HIV. When asked to choose effective practices to prevent HIV infection, two thirds of participants selected at least one ineffective practice, and only 22% of all subjects could accurately select all the practices that specifically prevent infection. These findings highlight the need for focused HIV education programs in this community, as even well educated individuals hold basic misconceptions about HIV transmission. In addition, although most viewed HIV as a fatal disease, almost one third of participants assumed that HIV was curable. This misperception may affect individual behavior if people do not recognize that HIV incurable, or if they confuse successful antiretroviral treatment with cure. Further studies should explore these beliefs in greater depth and evaluate the community's perception of HIV as a treatable chronic illness.

Participants recognized the gravity of the HIV/AIDS epidemic, as they considered it to be a very severe problem in Ethiopia. Most participants overestimated the prevalence of HIV infected persons in both the United States and Ethiopia. For example, the majority of participants estimated the prevalence of HIV in Ethiopia to be between 15% and 30% whereas the national estimate is between 0.9% and 3.5% (UNAIDS, 2008). It is important to note, however, that there are prevalence rate discrepancies between the rural and urban areas of Ethiopia. The 2007 prevalence rate in Ethiopia's capital, Addis Ababa, was approximately 7.5% (HIV/AIDS Prevention and Control Office [HAPCO], 2007) compared with the rural estimate of 0.7% (Taffa, Holm-Hansen, & Bjunel, 2002). Moreover, true prevalence estimates are likely higher, given that many HIV-positive individuals are never tested. As 56% of participants were born in Addis Ababa, their perception of the prevalence rate in Ethiopia is more likely to reflect the true prevalence rate in Addis Ababa. However, despite the urban bias in this group, there remains a large inconsistency between the actual estimates versus the perceived prevalence rate. For the U.S. estimates, most participants believed the prevalence was around 2.5%, which is greater than the actual 0.6% prevalence rate (UNAIDS, 2008). However, the magnitude of overestimation was much greater for the Ethiopian prevalence rate than the U.S rate. This perception may also contribute to the low perception of personal risk in this group, despite a fairly high rate of irregular condom use and multiple sexual partners. Nevertheless, the majority of subjects recognized that HIV could be prevented by maintaining monogamy (73%) and using condoms (87%). The disconnect between awareness of HIV transmission risks and personal risk perception has also been found in studies performed in the native Ethiopian population, where 64% of males reported at least five lifetime sexual partners, but only 17% perceived their lifestyles as prone to becoming infected (Sahlu et al., 1999). The separation between individual knowledge of HIV transmission and personal risk perception needs to be studied further in order to develop effective HIV education and prevention programs.

As an initial study of HIV beliefs and risk perception in the immigrant Ethiopian population, our results have provided information on specific areas warranting further investigation.

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