

Assessing HIV Testing History, Interest, and Risk-Taking among Adult Patients at the Karl Heusner Memorial Hospital Authority Accident and Emergency Department in Belize

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BACKGROUND

Belize has one of the highest HIV prevalences in Central America; approximately 1.9% of Belizeans 15–49 years-old are infected with HIV.^{1,2} Two hundred twenty-five people in Belize were diagnosed with HIV in 2016, which translates to an estimated incidence of 1.3 per 1000 persons 15–49 years-old.^{2,3} Data from 2011–2013 showed that only 28.4% of Belizean adults 15–49 years-old had received an HIV test and knew their results.⁴

Testing in emergency departments (EDs) has been advocated for and used as a means of identifying those with an undiagnosed HIV infection who might not be tested elsewhere.^{5–10} Routine HIV testing of patients in the ED can assist staff to provide appropriate clinical care.^{6,7} It also allows for early detection and linkage to care of HIV-infected individuals who might not be tested until later in their disease course.^{6,7} The Belize Ministry of Health, World Health Organization, and UNAIDS support HIV testing and treatment as a major initiative to reduce HIV transmission.^{3,11,12}

The Karl Heusner Memorial Hospital Authority (KHMHA) in Belize City is the largest public referral hospital in Belize and its Accident and Emergency (A&E) Department provides care to approximately 25,000 adult patients annually. However, there is no established HIV testing protocol for A&E patients. Given its major role in providing healthcare and the unmet need of HIV testing in Belize, the KHMHA A&E could be an ideal place to conduct HIV screening. Evidence supportive of this role for A&E is needed before a testing program can be designed and launched.

In response to this lack of evidence, we aimed to establish if there is a need for HIV testing in the KHMHA A&E, based on lack of prior HIV testing despite the presence of reported HIV risk-taking behaviors of A&E patients. We also aimed to gauge patient interest in, perceived need for, and possible barriers to HIV testing in the A&E.

METHODS

This cross-sectional survey-based investigation was conducted over an eight-week period from June 2018 to August 2018 at the KHMHA A&E. The study was approved by the

Institute of Social and Cultural Research of Belize as well as by the Lifespan Institutional Review Board (947934-5).

Participant Recruitment

A&E patients were assessed for study eligibility over an eight-week study period during five-hour data collection shifts that started between 8 am to 2 pm daily, 7 days/week. The start time for each shift was determined randomly for each day of the study. During these data collection shifts, all patients in the A&E were approached and asked to participate. Each patient underwent an assessment to confirm study eligibility. Eligible participants were: 18–65 years-old (testing ages recommended by the Belize Ministry of Health), English-speaking, not critically ill or injured, not a prison inmate/under arrest, and able to provide consent. Small, non-monetary incentives (e.g., earbuds, pens, and penlights) were provided for study completion.

Eligibility/Questionnaire Procedures

After providing consent, participants were queried about their sociodemographic characteristics (age, sex, race, area of residence, marital status, education, insurance status, primary health care provider status, and HIV testing history). Participants who believed themselves to be HIV uninfected or did not know their status were asked to complete the remainder of the study using an audio computer self-interviewing (ACASI)-based questionnaire on a tablet computer (QDS Software, Nova Research, Silver Springs, MD). The questionnaire was adapted from prior research by the study authors.^{13–15}

The questions concerned their HIV risk behaviors (from injection-drug use and sex), and opinions of and interest in HIV testing being offered in the KHMHA A&E. For HIV sexual risk, participants were asked to report if they had condomless sex in the past 10 years by sexual partner type (main, casual, or exchange) and the number of each type of partner. Ten years is the expected time period that could elapse before signs and symptoms of AIDS usually appears. All collected data contained no personal identifiers and study staff were blinded to participant responses during data collection.

Data Analysis

Total enrollment, patient demographic characteristics and HIV testing history, interest and risk were summarized with percentages and medians for the entire study population and

also by HIV testing status (ever vs. never tested). Potential differences between participants ever vs. never tested were analyzed using χ^2 testing for categorical data, Fisher's Exact test for binary variables, and Wilcoxon's test for continuous variables. Multivariate logistic regression models were used to examine factors associated with ever vs. never tested; odds ratios with 95% confidence intervals (CIs) were estimated. Attitudes toward HIV testing in the A&E and the importance of HIV testing were examined by HIV testing status.

RESULTS

Patient Demographics Characteristics and HIV Testing History

Recruitment results are depicted in **Figure 1**.

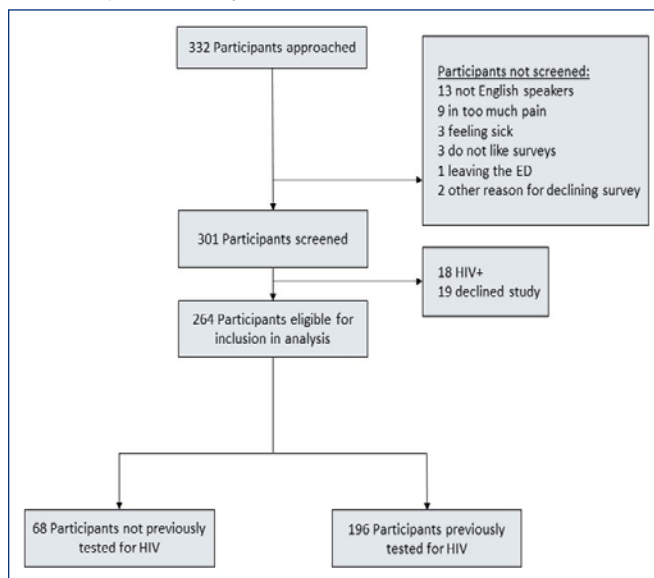
As shown, 18 (6%) of the 301 A&E patients screened for study eligibility self-identified as HIV infected. Of the 264 participants not known to be HIV infected, 25.8% (95% CI: 20.6-31.5) had never been tested for HIV. The majority of participants were female, of Creole descent, and lived in the Belize district (**Table 1**). Most often participants had either an unmarried partner or a domestic partner, had received less than a tertiary school level of education, did not have healthcare insurance, and had a primary care provider. As compared to those previously tested, those never tested for HIV were more likely to be male, have fewer years of formal education, and less likely to regularly receive medical care.

The most common reasons for previous HIV testing were patient curiosity (7.5%); pregnancy (20.5%); and for a medical exam, hospitalization, or

Table 1. Sociodemographic Characteristics of All Participants and Participants Stratified by HIV Testing Status

	All Participants (n = 264)	Never Tested for HIV (n = 68)	Ever Tested for HIV (n = 196)	p-value p<
	n (%)	n (%)	n (%)	
Median age (years) (IQR)	36 (27-49)	34.5 (22-55)	36.5 (28-47)	
Gender				0.0001
Male	111 (42.1)	43 (63.2)	68 (34.7)	
Female	153 (57.9)	25 (36.8)	128 (65.3)	
Race/Ethnicity				0.65
Creole	172 (65.2)	42 (61.8)	130 (66.3)	
Mayan	8 (3.0)	2 (2.9)	6 (3.1)	
Mestizo	28 (10.6)	6 (8.8)	22 (11.2)	
Garifuna	23 (8.7)	8 (11.8)	15 (7.6)	
Hispanic	6 (2.3)	1 (1.5)	5 (2.6)	
Spanish	17 (6.4)	6 (8.8)	11 (5.6)	
Caucasian	1 (0.4)	1 (1.5)	-	
Other	9 (3.4)	2 (2.9)	7 (3.6)	
Residence				0.10
Belize	232 (87.9)	57 (83.8)	175 (89.3)	
Cayo	9 (3.4)	2 (2.9)	7 (3.6)	
Corozal	5 (1.9)	1 (1.5)	4 (2.0)	
Orange Walk	8 (3.0)	4 (5.9)	4 (2.0)	
Stann Creek	6 (2.3)	4 (5.9)	2 (1.1)	
Toledo	4 (1.5)	-	4 (2.0)	
Marital status				0.23
Married	16 (6.1)	6 (8.8)	10 (5.1)	
Domestic partner	44 (16.7)	9 (13.2)	35 (17.9)	
Divorced	12 (4.5)	4 (5.9)	8 (4.1)	
Widowed	11 (4.2)	3 (4.4)	8 (4.1)	
Separated	12 (4.6)	1 (1.5)	11 (5.6)	
Never married	73 (27.6)	25 (36.8)	48 (24.5)	
Unmarried couple	96 (36.3)	20 (29.4)	76 (38.7)	
Education				0.001
None	8 (3.0)	3 (4.4)	5 (2.6)	
Primary school	72 (27.3)	29 (42.7)	43 (21.9)	
Secondary school	113 (42.8)	29 (42.7)	84 (42.9)	
Tertiary school	43 (16.3)	6 (8.8)	37 (18.9)	
Sixth form	14 (5.3)	-	14 (7.1)	
University	14 (5.3)	1 (1.47)	13 (6.6)	
Health insurance status				0.01
None	172 (65.2)	54 (79.4)	118 (60.2)	
Regular	27 (10.2)	6 (8.8)	21 (10.7)	
National health insurance	65 (24.6)	8 (11.8)	57 (29.1)	
Receive regular medical care				0.02
No	115 (43.6)	38 (55.9)	77 (39.3)	
Yes	149 (56.4)	30 (44.1)	119 (60.7)	

Figure 1. Participant Flow Diagram



before surgery (16.3%). Of those who had been tested, 19.9% underwent testing more than five years ago, 15.8% between two and five years ago, 12.2% between one and two years ago, 15.3% between six months and one year ago, and 36.7% of participants had been tested less than six months ago. Among those not previously tested for HIV, the most common reasons were that the patient either believed they were not at risk so the test was not necessary (32.4%), or because they had never been asked or offered a test (27.9%).

HIV Risk-taking Behavior and Factors Associated with Previous HIV Testing

Injection-drug use was infrequent among participants, but more common among those who had never been tested for HIV (Table 2). Among all participants, approximately half reported condomless sex with main partners, while fewer reported condomless sex with casual and exchange partners. Condomless sex with main, casual and exchange partners did not differ by testing status. As shown in Table 3, lack of HIV testing was associated with fewer years of formal education and male gender.

Patient Opinion and Interest on HIV Testing

The overwhelming majority of patients thought that it was important or very important for the A&E to offer HIV testing in general (90.1%), while slightly fewer thought it was important or very important for them personally to be tested in the A&E (80.2%) (Table 4). There was no significant statistical difference between the never vs. ever tested group in their opinions on importance of the A&E to offering HIV testing or the importance on personally being tested. The majority of participants did not believe that HIV testing in the A&E delayed medical care, took too long, or was too stressful. However, most were concerned about privacy of testing in this setting. There were no significant statistical differences on beliefs of potential barriers to A&E HIV testing between those tested vs. never tested.

DISCUSSION

The results of this study support the need for HIV testing in the KHMHA A&E. Approximately 25% of A&E patients have not been tested elsewhere, despite the majority of patients having primary care. Of those not previously tested, over a quarter indicated that they had never been offered testing. Among those never tested, a substantial proportion reported injection-drug use or condomless sex with casual or exchange partners, and almost half believed that it was at least possible they were HIV infected but did not know it. Thus, A&E testing might reach these potentially higher-risk individuals, particularly those are not being tested elsewhere. Furthermore, over 6% of study participants reported living with HIV, which meets previous recommended thresholds for ED-based HIV testing in the US and globally.^{16,17} The

Table 2. Self-Reported HIV Risk-taking Behaviors of All Participants and Participants Stratified by HIV Testing History

	All Participants (n = 264)	Never Tested for HIV (n = 68)	Ever Tested for HIV (n = 196)	p-value p<
	n (%)	n (%)	n (%)	
Injection drug Use				0.0002
No	248 (93.9)	57 (83.8)	191 (97.5)	
Yes	16 (6.1)	11 (16.2)	5 (2.5)	
Condomless sex with main partners				0.05
No	134 (50.8)	42 (61.8)	92 (46.9)	
Yes	130 (49.2)	26 (38.2)	104 (53.1)	
Condomless sex with casual partners				0.87
No	194 (73.5)	51 (75.0)	143 (73.0)	
Yes	70 (26.5)	17 (25.0)	53 (27.0)	
Condomless sex with exchange partners				0.81
No	240 (90.9)	63 (92.6)	177 (90.3)	
Yes	24 (9.1)	5 (7.4)	19 (9.7)	
How likely infected with HIV				0.02
Not possible at all	182 (72.2)	34 (54.8)	148 (77.9)	
A little likely	41 (16.3)	17 (27.4)	24 (12.6)	
Somewhat likely	12 (4.8)	5 (8.1)	7 (3.7)	
Likely	7 (2.8)	2 (3.2)	5 (2.6)	
Very likely	10 (4.0)	4 (6.5)	6 (3.2)	

Table 3. Multivariable logistic model of factors associated with no prior HIV testing

Variable	Adjusted Odds Ratio (95% CI)
Age	0.99 (0.97, 1.02)
Male	2.81 (1.50, 5.26)
Non-Creole	1.11 (0.56, 2.18)
Living outside of Belize City	1.30 (0.51, 3.31)
No regular medical care	1.63 (0.86, 3.12)
Education	
Primary school or less	4.75 (1.83, 12.35)
Secondary school	2.51 (0.98, 6.39)
Tertiary school or more	Reference
Health Insurance	
Regular health insurance	Reference
National health insurance	0.90 (0.24, 3.33)
None	1.85 (0.62, 5.51)
Sexual history in past 10 years	
No condomless sex	Reference
Main partner only condomless sex	0.73 (0.29, 1.85)
Casual or exchange partner condomless sex	1.33 (0.64, 2.76)

Table 4. Attitudes Towards HIV Testing in the ED and Importance of HIV Testing

	All Participants (n = 264)	Never Tested for HIV (n = 68)	Ever Tested for HIV (n = 196)	p-value p<
	n (%)	n (%)	n (%)	
Importance of A&E to offer HIV testing				0.30
Not at all important	3 (1.19)	-	3 (1.58)	
A little important	10 (3.9)	3 (4.8)	7 (3.7)	
Somewhat important	12 (4.8)	3 (4.8)	9 (4.7)	
Important	65 (25.8)	20 (32.3)	45 (23.7)	
Very important	162 (64.3)	36 (58.1)	126 (66.3)	
Importance for you to be tested in the A&E for HIV				0.48
Not at all important	17 (6.8)	2 (3.2)	15 (7.9)	
A little important	17 (6.8)	4 (6.5)	13 (6.8)	
Somewhat important	16 (6.4)	4 (6.5)	12 (6.3)	
Important	75 (29.8)	20 (32.3)	55 (29.0)	
Very important	127 (50.4)	32 (51.6)	95 (50.0)	
Being tested for HIV in the A&E delays medical care				0.23
Definitely delays	41 (16.3)	11 (17.7)	30 (15.8)	
Probably delays	38 (15.1)	10 (16.1)	28 (14.7)	
Maybe delays	42 (16.7)	13 (21.0)	29 (15.3)	
Probably does not delay	71 (28.2)	16 (25.8)	55 (29.0)	
Definitely does not delay	60 (23.8)	12 (19.4)	48 (25.3)	
Being tested for HIV in the A&E takes too long				0.28
Definitely too long	49 (19.4)	13 (21.0)	36 (19.0)	
Probably too long	38 (15.1)	7 (11.3)	31 (16.3)	
Maybe too long	39 (15.5)	16 (25.8)	23 (12.1)	
Probably too long	73 (29.0)	20 (32.3)	53 (27.9)	
Definitely not too long	53 (21.0)	6 (9.7)	47 (24.7)	
Being tested for HIV in the A&E is too stressful				0.13
Definitely too stressful	38 (15.1)	9 (14.5)	29 (15.3)	
Probably too stressful	40 (15.9)	12 (19.4)	28 (14.7)	
Maybe too stressful	35 (13.9)	13 (21.0)	22 (11.6)	
Probably not too stressful	67 (26.6)	16 (25.8)	51 (26.8)	
Definitely not too stressful	72 (28.6)	12 (19.4)	60 (31.6)	
A&E is not private enough for HIV testing				0.17
Definitely not private enough	92 (36.5)	18 (29.0)	74 (39.0)	
Probably not private enough	48 (19.1)	13 (21.0)	35 (18.4)	
Maybe private enough	33 (13.1)	9 (14.5)	24 (12.6)	
Probably private enough	45 (17.9)	11 (17.7)	34 (17.9)	
Definitely private enough	34 (13.5)	11 (17.7)	23 (12.1)	

study results also indicate variations in lack of HIV testing among A&E patients, specifically male gender and lower levels of education. The gap between male and female testing in Belize is well known and has been specifically identified as a problem that needs to be addressed in the Belize Epidemiology Unit's most recent report.³ A majority of females in Belize undergo HIV testing during prenatal care, but there are fewer routine testing opportunities for males. By incorporating HIV testing, the A&E might be able to help reduce gender-based HIV testing disparities in Belize City.

The participants overwhelmingly responded positively to testing being offered in the A&E, although they were slightly more likely to recommend it for all patients than for themselves personally. This phenomenon has been observed previously.¹⁵ However, participants did indicate concerns about A&E testing, chiefly about privacy in this setting. A significant minority of patients were concerned about time for testing in the A&E and that it might delay care or increase time spent waiting in the A&E, as well as the stress of being tested. Some possible strategies to mitigate this could be to provide reassurance to patients that their test results will be kept confidential and providing HIV testing results in private to prevent other patients from hearing test results. Educating and patients about HIV testing and preparing them for the experience might reduce stress. Qualitative interviews of patients at the A&E reveal that patients prefer to have their HIV test offered at the beginning of their visit during check-in/triage to reduce delays and that privacy is a significant concern for physicians, nurses, and patients.¹⁸

Limitations

This study was performed only at one site serving one of Belize's six districts. As such, these results may not be generalizable to A&Es in other regions of the country. Even though we tried to collect a representative sample of the adult patient population at this A&E, certain patients were excluded. These patients include those who were in the A&E when data was not being collected (i.e., patients evaluated during late night/early morning hours), non-English speaking patients, or presented at other times of the year, assuming a seasonal variation in patient demography. HIV testing and prevalence could differ in these particular patient groups. In addition, the data was self-reported and anonymous which meant that survey responses could not be verified. Finally, small samples might have reduced ability to make comparisons between groups.

CONCLUSION

The absence of prior HIV testing, lack of being offered an HIV test previously, and the high prevalence of reported HIV risk behaviors indicate that patients at the KHMHA A&E could benefit from an HIV testing program. Furthermore, patients are overwhelmingly supportive of A&E-based testing, although some patient concerns about being tested in this setting need to be addressed.

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