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HIV/AIDS Stigmatization in the Healthcare Setting: A Cross-Sectional Study of PMTCT Service Providers in Primary Healthcare Centers in Lagos, Nigeria

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ABSTRACT

Objective: To assess HIV/AIDS stigma and discrimination among PMTCT service providers in primary healthcare centers in Lagos, Nigeria.

Design: Cross-sectional survey.

Setting: Thirty-eight primary healthcare centers in Lagos, Nigeria.

Participants: One hundred sixty-one (161) PMTCT service providers.

Outcome measures: PMTCT service providers' discriminatory behaviors, opinions, and stigmatizing attitudes towards persons living with HIV/AIDS (PLWHA), and nature of the work environment (policies related to HIV/AIDS management/support, infection control guidelines/supplies, and anti-discriminatory policies).

Results: Observed stigmatization was low: very few (4%) reported hearing co-workers talk badly about PLWHA or observed poor quality care to PLWHA (15%). Health workers were not worried about secondary stigmatization due to their occupation (86%). Opinions about PLWHA were generally supportive; service providers strongly agreed that women living with HIV should be allowed to have babies if they wished (94%). Regarding institutional policies, PMTCT service providers (86%) knew that consent of the pregnant woman was needed prior to HIV testing. Most participants (83%) noted that they would get in trouble at work if they discriminated against PLWHA. A minority reported discriminatory attitudes (preference not to treat PLWHA if they had the choice); 39% reported wearing double gloves, and 41% admitted to using other special infection-control measures when providing services to PLWHA. Discriminatory behaviors were correlated with negative opinions about PLWHA ($r = 0.21$, $p < 0.01$), fear of HIV infection ($r = 0.16$, $p < 0.05$), and professional resistance ($r = 0.32$, $p < 0.001$). Those who received HIV training had less fear of contagion.

Conclusions: Our study documented low levels of stigmatization among PMTCT service providers in primary health care centers in Lagos. The findings suggest that it may be effective to establish healthcare facility policies related to HIV/AIDS management/support, infection control guidelines/supplies, anti-discriminatory policies, and service-provider training.

ARTICLE SUMMARY

Strengths and limitations of the study

- Understanding healthcare workers' attitudes, behaviors, and perceived risk of HIV infection can inform policies and practices to reduce stigma-related barriers for PLWHA in healthcare settings, thereby improving access to and quality of preventive services and treatment.
- Use of an internationally validated and locally adapted tool strengthens the findings of this study and provides a more comprehensive approach to describing HIV-related stigmatization among health workers in the study setting than previous studies conducted in Nigeria and sub-Saharan Africa.
- Self-reported attitudes and behaviors of healthcare workers may be subject to social desirability bias, particularly among those who have previously received HIV/AIDS stigma training.
- Experiences of stigmatization and discrimination among PLWHA may be markedly different from those reported by health workers.

INTRODUCTION

With over 3.2 million people infected, Nigeria's HIV epidemic affects all population groups and geographic areas, making the country the second largest in the global burden of the HIV epidemic (1). According to the Joint United Nations Program on AIDS (UNAIDS), Nigeria is one of 22 priority countries that account for 90% of pregnant women living with HIV globally (2). Although the country has made notable progress in addressing HIV/AIDS, as shown in a 21% decrease in new infections and a 6% decrease in deaths since 2010, Nigeria still represents the world's largest gap between present conditions and eradicating mother-to-child transmission (MTCT) of HIV (3), accounting for nearly 30% of global MTCT (4). While many countries in sub-Saharan Africa (SSA) have made strides in reducing the MTCT burden, Nigeria is not on target to reach the Global Plan of eliminating new HIV infections among children by 90% (5).

Available evidence shows that serious barriers exist in Nigeria against service uptake and retention in PMTCT care (6, 7). A recent study demonstrated the effectiveness of a culturally adapted, faith-based program in increasing HIV counseling, testing, and enrollment in care among pregnant women and their male partners in Nigeria (6, 8, 9). However, the study's post-intervention analysis of factors influencing refusal to test for HIV revealed that fear of stigmatization and discrimination was a major reason for not testing (10). Stigmatization and discrimination pose barriers at each step of the PMTCT care cascade, and such barriers must be addressed to prevent pediatric HIV in Nigeria.

The phrase "AIDS-related stigma" or "AIDS-related stigmatization" refers to the prejudice, discounting, discrediting, and discrimination directed at people perceived to have HIV or AIDS (11). Duckitt describes two concepts associated with stigmatization: 1) prejudice (the attitude) – an evaluation or judgment toward members of a stigmatized group, which involves emotions of fear, disgust, anger, and contempt; and 2) discrimination (the act) – differential treatment of individuals according to their membership of a stigmatized group (12). Analysis of Nigeria's 2013 Demography and Health Survey showed that nearly 50% of adults (aged 15-49) responded "no" to the question, "Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV?" (13, 14).

Although individuals usually learn of their HIV seropositive status at a healthcare facility, healthcare settings are often cited as places where people also experience the most direct AIDS-related stigmatization (15). Stigmatization experienced in healthcare settings is particularly important since it can directly prevent individuals from seeking prevention and care services. Stigmatizing acts by healthcare workers may include refusal to treat HIV-positive persons, burning the linen of HIV-infected patients, charging HIV-infected patients for the cost

of infection control supplies, and early hospital discharge (16-21). Other acts include ward segregation, isolation, lack of confidentiality (sharing information on patients' HIV positive status with hospital workers and other patients), and selective application of "universal" precautions (e.g., use of gloves with only HIV-infected patients) (16-21). Study of AIDS stigmatization among primary healthcare workers in Ilorin, Nigeria, revealed that 98% of health workers reported observing discrimination against persons living with HIV/AIDS by other health workers (22). In a similar study in neighboring Ghana, health workers who care for persons living with HIV/AIDS expressed concerns about secondary stigmatization by family members and friends who know they interact with such patients (23, 24). Some health professionals take extreme caution when treating HIV-positive individuals, exacerbating a medical environment in which stigmatization and discrimination lead to differential treatment of PLWHA (24).

Lagos recently intensified efforts to scale up PMTCT services through multiple strategies, including training and engagement of primary healthcare center (PHC) personnel and traditional birth attendants (TBAs). As part of this strategy, PMTCT services were integrated into maternal and child health (MCH) services at the PHC level in the state. PHCs represent people's first level of contact with the health system and are typically located near the communities they serve. Task shifting to engage PHCs in efforts to expand access to PMTCT services has the potential to increase access to PMTCT (25). However, in situations where most people know each other, and health workers know and are known by many in a community, confidentiality may be difficult to maintain, thus leading to increased concern about stigmatization. The objective of this study was to assess the extent to which stigmatization and discrimination exist in PHCs in Lagos, using a standard, validated instrument. It was hoped that

evidence from this study would help catalyze high-level support for eliminating MTCT of HIV in Lagos, Nigeria.

DESIGN AND METHODS

Study area and setting

The study was conducted in Lagos state, southwest Nigeria. With a population of 13,463 million inhabitants (26), Lagos is the commercial center of both Nigeria and the West African sub-region. The large population and the fluid movement of people in and out of the state, have significant implications for the spread of HIV/AIDS. Lagos has 20 Local Government Areas (LGAs), 37 Local Council Development Areas (LCDAs), and approximately 2,000 communities (27). The HIV prevalence rate among adults is 4.1%—higher than the national average of 3.2% (28). At the end of 2015, an estimated 217,569 individuals (adults and children) were positive for HIV/AIDS in Lagos state (5).

Research design and population

The study instrument was an exploratory, descriptive, cross-sectional survey. Participants were one hundred and sixty-one (161) health workers providing PMTCT services in thirty-eight (38) PHCs in ten (10) LGAs in the central and western districts of Lagos. Only health workers involved in direct patient care (nurses and nursing assistants) or who had access to information on clients' HIV serostatus (laboratory workers, pharmacists, pharmacy technicians, and medical records personnel) participated.

Data collection

Data were collected by JE and VY between April and July 2017 using direct interviews via REDCap (Research Electronic Data Capture) software (29). Ethical approval was given by the Nigeria Health Research Ethics Commission, and additional approvals were obtained from the Lagos State Ministry of Health and the Lagos State Primary Health Care Board. Following receipt of approval, the investigators contacted medical officers of health in LGAs in the Central and Western Districts about the study's nature and purpose and to seek permission to conduct the study. Consenting officers introduced the study team to the nursing officers in charge of PMTCT services in their respective PHCs. Potentially eligible participants at each PHC were provided with detailed information about the study. Health providers who expressed willingness to participate were asked to sign an informed consent form. To ensure confidentiality, each participant was assigned a unique study identification (ID) number.

Validity and reliability of instrument

Data were collected using the Brief Questionnaire for Measuring HIV Stigma and Discrimination among health facility staff, developed and validated by the United States Agency for International Development (USAID) (30). The instrument was validated locally through a pilot study with a purposive sample of ten PMTCT workers in two PHCs. These pilot participants were not included in the main study; however, their feedback was used to modify and adapt the instrument as appropriate. Data were collected on (1) participant demographics, (2) discriminatory behaviors, (3) opinions and stigmatizing attitudes towards persons living with HIV/AIDS (PLWHA), and (4) work environment. Variables in demographic information and work-related characteristics included age (≤24, 25-39, 40-55, and 56 or above), gender,

professional category (doctor, nurse, laboratory technician, etc.), professional contact with PLWHA (yes or no), number of staff working directly on provision of PMTCT services (1-3, 4-6, 7-9, and >9), number of HIV-positive patients served per week, and HIV-related training status, including training on stigmatization and discrimination (yes or no) (Table 1).

Healthcare workers' discriminatory behaviors were grouped into the following areas: extra infection precautions, observed stigma, and secondary stigma (Table 2). For extra infection precautions and observed stigma, the original responses for each statement were 1 (*yes*), 0 (*no*), or 777 (*I would prefer not to answer or can't remember*). A score of 1 was given for a '*yes*' response and 0 for '*no,*' '*I would prefer not to answer,*' or '*can't remember.*' For secondary stigma, participants responded using a 4-point Likert-type scale ranging from 0 (*not worried/never*) to 3 (*very worried/most of the time*). Higher scores indicated that the respondent held a stronger discriminatory attitude.

Attitudes towards PLWHA were assessed through 5 questions on opinions about people living with HIV, 4 questions concerning fear of contracting HIV infection, 4 questions on willingness to care for key populations, and 15 questions related to health workers resistance/preference for not treating PLWHA and key populations (Table 3). For opinions about PLWHA, the responses were scored as 1 for '*yes*' and 0 for '*no*' or '*don't know.*' For the remaining variables, participants responded using a 4-point Likert-type scale ranging from 0 (*strongly disagree/don't know*) to 3 (*strongly agree*). Higher scores indicated that the respondent held a stronger stigmatizing attitude. Work environment measured policies related to HIV management/support and infection control guidelines/supplies (6 questions). A score of 1 was given for a '*yes*' response and 0 for '*no*' or '*don't know.'* Higher scores indicated greater health facility policies and procedures (Table 4).

Data analysis

All analyses were performed using STATA statistical software (Version 14, Stata Corp; College Station, Tx). Descriptive statistics were used to describe healthcare workers' demographic characteristics, professional cadre, professional contact with PLWHA, number of HIV-positive patients served per week, HIV-related training experiences, HIV-related discriminatory behaviors and stigmatizing attitudes, and presence of institutional policies and procedures. Pearson correlation coefficients were calculated to assess the relationship between professional resistance to treat PLWHA and key populations, negative emotions towards people with HIV, negative opinions about key populations, fear of contagion, observed stigma, secondary stigma, HIV training, institutional policies, work environment, and demographic variables such as age and gender. Furthermore, three multiple regression analyses were conducted to examine associations among level of discrimination at work, stigmatizing attitudes, and presence of institutional policies and procedures, controlling for the simultaneous effects of participant age, gender, professional cadre, personal contact with PLWHA, and HIV-related training experiences. We tried to answer the following questions: How do healthcare workers' stigmatizing attitudes and their work environment influence their discriminatory intent at work toward PLWHA? How are healthcare workers' demographics, work and HIV training, and perceived infection risk at work associated with their stigmatizing attitudes and work environments? Regression coefficient estimations and their significant levels are described.

Patient and public involvement

Patients or members of the public were not involved in the design, conduct, or dissemination of this study.

RESULTS

Respondent characteristics

As shown in Table 1, most respondents (83.8%) were women aged 25-39 years (48.7%) or 40-55 (40.6%). Professional cadres represented in the survey included 44 nurses/midwives (27.7%), 30 community health extension workers (18.9%), and 24 laboratory personnel (15.1%). Sixty-nine percent of the respondents reported having direct contact with HIV-positive individuals, averaging two contacts per week. Most respondents (74.5%) indicated having received previous training on informed consent and confidentiality, and on infection control and universal precautions (70.8%). Sixty percent reported receiving training on HIV stigmatization and discrimination.

Table 1: Demographic and work-related characteristics of respondents*

Baseline characteristics	No	%
Age group (in years) (n=160)		
≤24	10	6.25
25-39	78	**48.75**
40-55	65	**40.63**
56 and above	7	4.38
Gender (n=161)		
Male	26	16.15
Female	135	**83.85**
Profession (n=159)		
Laboratory Technician / Scientist	24	**15.09**
Medical Records Personnel	22	13.84
Comm. Health Extension Worker	30	**18.87**
Nurse / Mid-Wife	44	**27.67**
Pharmacist	17	10.69
Database operator	2	1.26
Counseling Specialist	11	6.92
Other**	9	5.66
Personal contact with PLWHA (n=159)		
Yes	110	**69.18**
No	49	30.82
Number of staff working directly on provision of PMTCT (n=160)		
1-3	50	31.25
4-6	65	40.63
7-9	26	16.25
>9	19	11.88
Number of HIV-positive patients served per week (n=161), median (IQR)	2	3
Training (n=161)		
HIV stigma and discrimination	96	59.63
Infection control and universal precautions (including post-exposure prophylaxis)	114	**70.81**
Patients' informed consent, privacy and confidentiality	120	**74.53**
Key population stigma and discrimination	93	57.76

n = number of responses; PMTCT = Prevention of mother-to-child transmission; IQR = interquartile range

*Some respondents left some questions with blanks or no answers; these were not included in the number of responses for the specific question.

**Other profession comprises accountants, cashiers, and administrators.

Discriminatory behaviors

Most of the healthcare workers (87%) did not avoid people with HIV/AIDS (Table 2). More than half (59%) of the respondents did not use double gloves when treating PLWHA. Eighty-three percent had not encountered another healthcare worker who was unwilling to care for a PLWHA, 85% had not witnessed provision of poor quality services to PLWHA, and 93% had not witnessed other healthcare workers talking badly about PLWHA. However, 39% reported wearing double gloves, and 41% used other special infection-control measures when providing services to PLWHA.

Regarding secondary stigmatization, participants reported low levels of enacted secondary stigma and low levels of anticipated secondary stigma. Most respondents (87%) were not worried about people talking badly about them because of their work with PLWHA, nor were they worried about friends and family (86%) or colleagues (94%) avoiding them. Most did not experience people talking badly about them (83%) and had not been avoided by friends and family (93%) or colleagues (93%) because they cared for PLWHA.

Table 2: HIV-related discriminatory behaviors among healthcare workers* (n=161)

Variables	Yes n(%)	No n(%)	No opinion n(%)
Extra infection precautions			
Avoid physical contact	18 (11.18)	**140(86.96)**	3(1.86)
Wear double gloves	**62 (38.51)**	**95(59.01)**	4(2.48)
Use any special infection-control measures with PLWHA that you usually do not use	**66 (40.99)**	**90(55.9)**	5(3.11)
Observed stigma			
Workers unwilling to care for a patient living with or thought to be living with HIV	21 (13.04)	**134(83.23)**	6(3.73)
Workers providing poorer quality of care to patients with or thought to be living with HIV	14(8.70)	**137(85.09)**	10(6.21)
Healthcare workers talking badly about people with or thought to be living with HIV	7 (4.35)	**150(93.17)**	4(2.48)
Secondary stigma**			
Worried about people talking badly about you because you care for PLWHA	21 (13.04)	**140(86.96)**	
Worried about friends and family avoiding you because you care for PLWHA	22 (13.66)	**139(86.34)**	
Worried about colleagues avoiding you because of your work caring for PLWHA	9 (5.59)	**152(94.41)**	
Experienced people talking badly about you because you care for PLWHA	28 (17.39)	**133 (82.61)**	
Been avoided by friends and family because you care for PLWHA	12 (7.45)	**149(92.55)**	
Been avoided by colleagues because of your work caring for PLWHA	11 (6.88)	**149(93.13)**	

n = number of responses; PMTCT = Prevention of mother-to-child transmission; IQR = interquartile range
*Some respondents left some responses blank; these were not included in the number of responses for the specific question.
** For consistency within the scale, "strongly agree" and "agree" were collapsed into a "yes" category and "strongly disagree" and "disagree" were collapsed into a "no" category; "once or twice," "several times," and "most of the time" were also collapsed into a "yes" category, and "never" were collapsed into a "no" category.

Attitudes towards PLWHA

A small proportion of respondents indicated that they would prefer not to provide services to PLWHA or key populations, 24% would prefer not to provide services to men who have sex with men, 22% would rather not provide services to people who inject illegal drugs, and 19% would prefer not to provide services to sex workers (Table 3). Similarly, a small proportion of the respondents expressed concern about HIV transmission through drawing blood from (31%) or dressing wounds of (25%) PLWHA. Less than half (40%) of the respondents believed that most PLWHA did not care if they infected other people; very few (26%) believed that most

PLWHA had multiple sexual partners or engaged in irresponsible behaviors (19%). Conversely, 94% agreed that women living with HIV should be allowed to have babies if they wished (Table 3).

When asked about occupational safety, less than half (46%) believed HIV/AIDS made their jobs risky. A similar proportion (42%) thought it was best to train a few specialists who would be responsible for treating PLWHA, and a few (32%) expressed fear of contracting HIV while on the job. Only 22% of respondents preferred to refer persons with HIV/AIDS to their professional colleagues, however, and only 19% would rather not have those at high risk of HIV/AIDS (intravenous drug users and homosexuals) as patients. Although 50% of respondents would not eat at restaurant where the chef had HIV/AIDS, 82% admitted that they often had tender, concerned feelings for PLWHA (Table 3).

Table 3: HIV-related opinions and stigmatizing attitudes among healthcare workers (n=161)

Variables	Yes n(%)	No n(%)	No opinion n(%)
Opinions about people living with HIV			
Most people living with HIV do not care if they infect other people.	**65(40.37)**	50(31.06)	46(28.57)
People living with HIV should feel ashamed of themselves.	12(7.45)	143(88.82)	6(3.73)
Most people living with HIV have had many sexual partners.	**42(26.09)**	75(46.58)	44(27.33)
People get infected with HIV because they engage in irresponsible behaviors.	**31(19.25)**	108(67.08)	22(13.66)
Women living with HIV should be allowed to have babies if they wish.	**152(94.41)**	8(4.97)	1(0.62)
Fear of contracting HIV infection			
Worried about touching the clothing or bedding of a PLWHA	12(7.45)	144(89.44)	5(3.11)
Worried about dressing the wounds of a PLWHA	**40(24.84)**	110(68.32)	11(6.83)
Worried about drawing blood from a PLWHA	**50(31.06)**	101(62.75)	10(6.21)
Worried about taking the temperature of a patient living with HIV	5(3.11)	148(91.93)	8(4.97)
Willing to care for key populations			
Prefer not to provide services to people who inject illegal drugs.	**36(22.36)**	105(65.22)	20(12.42)
Prefer not to provide services to men who have sex with men.	**39(24.22)**	101(62.73)	21(13.04)
Prefer not to provide services to female sex workers	**30(18.63)**	116(72.05)	15(9.32)
Prefer not to provide services to male sex workers	**32(19.88)**	114(70.81)	15(9.32)
Professional resistance			
HIV/AIDS makes my job as a health worker to be a risky occupation	**74(45.96)**	83(51.55)	4(2.48)
Afraid of catching it because of my job in providing care for people with HIV.	**52(32.30)**	108(67.08)	1(0.62)
Do not want my child to go to a school with a child with HIV/AIDS	14(8.70)	141(87.58)	6(3.73)
Willing to eat in a restaurant where I know the chef has HIV/AIDS.	70(43.48)	**81(50.31)**	10(6.21)
Become infected with HIV if working with AIDS patients over a long period of time.	15(9.32)	144(89.44)	2(1.24)
Rather work with a better class of people than HIV/AIDS patients	13(8.07)	139(86.33)	9(5.59)
Prefer to refer persons with AIDS to my professional colleagues.	**35(21.74)**	121(75.15)	5(3.11)
Prefer not to work with AIDS patients.	18(11.18)	139(86.33)	4(2.48)
Consider changing my profession specialty/position if it becomes necessary	6(3.73)	152(94.41)	3(1.86)
Best to train a few specialists who would be responsible for treatment of AIDS patients.	**68(42.24)**	92(57.14)	1(0.62)
Won't treat those at high risk of AIDS such as intravenous drug users and homosexuals as patients.	31(19.25)	119(73.91)	11(6.83)
Sometimes find it hard to be sympathetic to AIDS patients.	28(17.39)	125(77.64)	8(4.97)
Resentful if AIDS patients accounted for a significant part of my caseload.	21(13.13)	116(72.5)	23(14.38)
Often have tender, concerned feelings for people with HIV/AIDS.	**132(81.99)**	22(13.66)	7(4.35)
Reluctant healthcare workers to work alongside a co-worker living with HIV	6(3.73)	120(74.53)	35(21.74)

Health facility policies and procedures

As shown in Table 4, most of the health facilities (83%) had written policies that aim to protect PLWHA from stigmatization and discrimination; in addition, most (81%) had standardized procedures and protocols that reduced risk of HIV infection to health workers as well as policies on HIV testing (77%). Thirty percent of the respondents noted that they did not have adequate supplies to reduce the risk of becoming infected with HIV. Over eighty percent (86%) of the respondents were aware that they could not test patients for HIV without their knowledge, and 83% indicated that they would get in trouble at work if they were found to discriminate against a PLWHA.

Table 4: Health facility policies and procedures (n=161)

Variables	Yes	No	No opinion
Policies to HIV management/support			
Policy on HIV testing	**124(77.02)**	20(12.42)	17(10.56)
Test a patient for HIV without their knowledge	21(13.04)	**139(86.34)**	1(0.62)
Get in trouble at work if discriminate against patients living with HIV	**132(82.50)**	15(9.38)	13(8.13)
Written guidelines to protect patients living with HIV from discrimination	**133(82.61)**	18(11.18)	10(6.21)
Infection control guidelines/supplies			
Adequate supplies that reduce risk of becoming infected with HIV	**104(64.60)**	48(29.81)	9(5.59)
Standardized procedures/protocols that reduce risk of becoming infected with HIV	**130(80.75)**	22(13.66)	9(5.59)

Correlation coefficients of the identified variables

While the number of discriminatory behaviors expressed by respondents was low in some instances, significant correlations occurred between discriminatory behavior and opinions of healthcare workers about PLWHA ($r = 0.21$, $p < 0.01$), fear of HIV infection ($r = 0.16$, $p < 0.05$), or professional resistance ($r = 0.32$, $p < 0.001$). When considering personal attributes, opinions about PLWHA were significantly associated with willingness to care for PLWHA ($r = 0.28$, $p <$

0.001), professional resistance (r = 0.37, p < 0.001), and quality of healthcare policies and procedures (r = 0.23, p < 0.01). Fear of contracting HIV infection was significantly associated with professional resistance (r = 0.34, p < 0.001), which was significantly correlated with willingness to care for PLWHA (r = 0.28, p < 0.001). In terms of socio-demographic variables, age was significantly correlated with opinions of healthcare workers about PLWHA (r = 0.17, p < 0.05) and healthcare policies and procedures (r = 0.28, p < 0.001). Providers who received HIV training had less fear of contracting HIV infection (r = -0.21, p < 0.01) and were less professionally resistant (r = −0.18, p < 0.05), but a positive relationship was evident with healthcare policies and procedures (r = 0.24, p < 0.01) (Table 5).

Table 5: Correlation Coefficients among Selected Variables

N°	Domains	1	2	3	4	5	6	7	8	9	10

1	Discriminatory behaviors at work	1.00									
2	Opinions about people living with HIV	0.21[b]	1.00								
3	Fear of contracting HIV infection	0.16[c]	0.11	1.00							
4	Willing to care for key populations	0.14	0.28[a]	0.08	1.00						
5	Professional resistance	0.32[a]	0.37[a]	0.34[a]	0.28[a]	1.00					
6	Healthcare policies and procedures	-0.09	0.23[b]	-0.01	0.06	0.04	1.00				
7	Age	-0.08	0.17[c]	0.06	0.11	0.10	0.28[a]	1.00			
8	Gender	0.04	0.09	0.04	-0.06	0.01	0.13	-0.01	1.00		
9	Contact with PLHA	0.11	0.10	-0.04	-0.05	-0.09	0.08	0.24[b]	0.24[b]	1.00	
10	Training	-0.06	0.04	-0.21[b]	0.13	-0.18[c]	0.24[b]	0.05	-0.06	0.11	1.00

a $p < 0.001$.
b $p < 0.01$.
c $p < 0.05$.

Multivariate results

In Table 6, results of multiple regression analyses show that health workers' HIV training and perceived on-the-job infection risk were important predictors of stigmatizing attitudes. Health workers who had received HIV-related training tended to report a significantly a lower degree of stigmatizing attitudes ($\beta = -0.10$), and those who perceived higher infection risk at work were more likely to display a higher degree of stigmatizing attitudes ($\beta = 0.84$). Older respondents ($\beta = 1.52$) also reported stronger prejudicial attitudes than their younger counterparts.

The second column of Table 6 summarizes findings from regression of work environment, controlling for all selected independent variables. HIV training was the most important predictor of perceived institutional support ($\beta = 0.21$). In addition, older respondents were shown to report stronger institutional support of their work with PLWHA ($\beta = 0.57$). In the final and complete regression model of discrimination at work, opinions and stigmatizing attitudes against PLWHA were the most important factors in predicting discrimination at work,

as the stronger the stigmatizing attitudes, the more frequent or intense the discrimination (β = 0.13). Younger healthcare providers were also more likely to express discriminatory behaviors towards PLWHA (β = −0.60). No association was found between perceived institutional support and discrimination.

Table 6: Estimates results from multivariate regression analysis

Variable	Stigmatizing attitudes	Health facility policies and procedures	Discriminatory behaviors
	n=157	n=157	n=156
Age	**1.52**[b]	**0.57**[a]	**-0.60**[b]
Sex	0.25	0.58	0.002
Profession	-0.02	-0.10	0.0001
Personal contact with PLWHA	-1.33	-0.10	**1.12**[b]
HIV training	**-0.10**[b]	**0.21**[c]	-0.07
Fear of HIV infection	**0.84**[c]		0.03
Attitudes towards PLWHA and key populations			**0.13**[a]
Health facility policies and procedures			-0.16
R^2	0.13	0.17	0.15

[a] $p < 0.001$.
[b] $p < 0.05$.
[c] $p < 0.01$.
PLWHA, persons living with HIV/AIDS

DISCUSSION

Although HIV stigmatization and discrimination pose significant risk to the physical and psychosocial well-being of people living with HIV, our current understanding of the extent of the problem among healthcare providers working within primary healthcare centers in sub-Saharan Africa (SSA) is limited. The current study of primary health centers in Lagos, Nigeria helps fill this knowledge gap by examining PMTCT service providers' stigmatizing attitudes, perceived risk of infection, and discriminatory behaviors towards patients living with HIV.

Contrary to earlier studies of HIV/AIDS in healthcare settings in Nigeria and elsewhere (22, 31, 32), our study revealed low levels of stigmatization and discrimination among health workers who provide PMTCT services in Lagos. Overall, we found low levels of secondary stigmatization and fewer negative attitudes and opinions towards PLWHA. We also found that most health facilities had policies and procedures that dealt with informed consent, confidentiality, and anti-discriminatory practices. Our analysis revealed that HIV training of PMTCT service providers was associated with reduced risk perception of HIV infection and fewer stigmatizing attitudes and opinions against PLWHA.

The generally low levels of stigmatization and discrimination observed among our study participants could be explained by several factors. First, as HIV antiretroviral therapy becomes more widely available, health workers are likely to feel more empowered and less resentful towards PLWHA. Earlier studies have shown that lack of available resources and treatment for HIV patients in healthcare settings was associated with an increased sense of despair among health workers, resentment towards HIV patients, and feelings of vulnerability to infection (31-33). Second, the Lagos state government and the US implementing partners, including the Centers for Disease Control and Prevention (CDC), the US Agency for International Development (USAID), and other local and US non-governmental agencies are actively overseeing PMTCT implementation. In fact, during field data collection, we witnessed several PHCs implementing training sessions facilitated by partner agencies. Extensive literature supports the association between HIV/AIDS training and awareness and (1) decreased fear of contagion and (2) reduced HIV stigmatization and discrimination (32, 34-36). Third, we found that most participating health workers were aware of the HIV/AIDS policies at their care centers. Participants noted that they would be disciplined if discovered engaging in behaviors that were

contrary to policy provisions. HIV anti-discriminatory policies in healthcare settings have been shown to be positively associated with reduced stigmatization and discrimination against PLWHA among health workers (34).

While government oversight and supporting partnerships are encouraging, it should be noted that 30% of the respondents indicated that they did not have adequate supplies to reduce their risk of becoming infected with HIV. This shortage of supplies and universal safety measures is a common challenge in many healthcare facilities in low- and middle-income countries (37, 38), potentially leading to avoidance of PLWHA (39) contributing to a preference for PLWHA to be treated by other providers. During data collection visits, we noted that most of the primary healthcare centers were not supplied with electricity, a perennial problem in Nigeria. Each care center received roughly ten thousand naira (30 US$) monthly for gasoline to power standby generators; however, in Nigeria gasoline is expensive and often in short supply. We observed instances in which health workers contributed money out-of-pocket to purchase gasoline for their standby generators. At night, many facilities also used rechargeable battery-powered emergency lanterns, including in delivery rooms. Such work conditions could have implications for job dissatisfaction, resulting in discrimination against PLWHA.

We found a positive relationship between the presence of HIV policies and infection-control guidelines and reduced stigmatization and discrimination against PLWHA, confirming that such policies can help regulate personal or social norms/beliefs (40). We also observed that HIV training may influence the perceived risk of HIV infection and reduce stigmatizing attitudes and opinions (41,42). In addition to changing attitudes and behaviors, training helps communicate and reinforce institutional policies and operational procedures.

Strengths of the study

This study has several notable strengths. First, we used a reliable standardized instrument for assessing stigmatization and discrimination within healthcare settings which incorporates relevant constructs and demonstrated discriminant validity (30). Developed by USAID, the instrument has been field-tested in several low- and middle-income countries, including China, Dominican Republic, Egypt, Kenya, Puerto Rico, and St. Kitts and Nevis. Our study extends evidence of the instrument's utility in similar settings. Second, our study supports the utility of the USAID instrument in assessing HIV stigmatization in primary healthcare centers and related non-hospital/clinic settings in low-income countries. Third, unlike previous studies, our analysis identified factors that mediate HIV stigmatization and discrimination in primary healthcare centers, particularly training and policies. As countries continue to implement task-shifting of services to increase access to antiretroviral treatment, further studies should assess the relationship between stigmatization and discrimination in primary healthcare centers, and uptake of counseling, testing, and enrollment into care. Evidence is also needed of the relationship between retention in HIV treatment and stigmatization and discrimination in primary healthcare settings.

Limitations

Findings from this study were based on self-reported stigmatizing attitudes and discriminatory behavior, responses that were potentially socially and professionally desirable based on previous training. Future studies among healthcare workers might avoid social desirability bias by asking about specific and objective observable behaviors rather than using subjective terms to identify discriminatory behaviors. Future studies should also examine

reported HIV-related stigmatization and discrimination among patients for comparison with healthcare providers' responses. Caution should be used in generalizing our study findings to other primary healthcare centers and locations in case of differing efforts and approaches by governments and related institutions.

CONCLUSIONS

Our study documented low levels of stigmatization among PHC workers—the first point of care to the community—in Lagos, Nigeria. Since much is at stake when PLWHA perceive stigmatization and discrimination within the healthcare setting, efforts to reduce stigmatization are central to increasing access to and retention of care for pregnant women and their male partners in need of PMTCT services. In addition to continued emphasis on training in and implementing anti-stigmatization and discrimination practices, the government and implementing partners should invest in resources that improve infection-control processes, mentoring, ongoing trainings, and innovative interventions to address the downstream effects stigmatization and discrimination against PLWHA.

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AIDS-Related Stigmatization in the Healthcare Setting: A Study of PMTCT Service Providers in Primary Healthcare Centers in Lagos, Nigeria

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AIDS-Related Stigmatization in the Healthcare Setting: A Study of PMTCT Service Providers in Primary Healthcare Centers in Lagos, Nigeria

ABSTRACT

Objective: To assess AIDS stigmatizing attitudes and behaviors by PMTCT service providers in primary healthcare centers in Lagos, Nigeria.

Design: Cross-sectional survey.

Setting: Thirty-eight primary healthcare centers in Lagos, Nigeria.

Participants: One hundred sixty-one (161) PMTCT service providers.

Outcome measures: PMTCT service providers' discriminatory behaviors, opinions, and stigmatizing attitudes towards persons living with HIV/AIDS (PLWHA), and nature of the work environment (HIV/AIDS-related policies, and infection control guidelines/supplies).

Results: Observed AIDS-related stigmatization was low: few respondents (4%) reported hearing co-workers talk badly about PLWHA or observed provision of poor-quality care to PLWHA (15%). Health workers were not worried about secondary AIDS stigmatization due to their occupation (86%). Opinions about PLWHA were generally supportive; providers strongly agreed that women living with HIV should be allowed to have babies if they wished (94%). PMTCT service providers knew that consent was needed prior to HIV testing (86%) and noted that they would get in trouble at work if they discriminated against PLWHA (83%). A minority reported discriminatory attitudes and behaviors; 39% reported wearing double gloves, and 41% used other special infection-control measures when providing services to PLWHA. Discriminatory behaviors were correlated with negative opinions about PLWHA ($r = 0.21$, $p < 0.01$), fear of HIV infection ($r = 0.16$, $p < 0.05$), and professional resistance ($r = 0.32$, $p < 0.001$). Those who received HIV training had less fear of contagion.

Conclusions: This study documented generally low levels of AIDS-related stigmatization by PMTCT service providers in primary health care centers in Lagos. Policies that reduce stigmatization against PLWHA in the healthcare setting should be supported with the provision of basic resources for infection control. This may reassure healthcare workers of their safety, thus, reducing their fear of contagion and professional resistance to care for individuals that are perceived to be at high risk for HIV.

ARTICLE SUMMARY

Strengths and limitations of the study

- Understanding healthcare workers' attitudes, behaviors, and perceived risk of HIV infection can inform policies and practices to reduce stigma-related barriers for PLWHA in healthcare settings, thereby improving access to, and quality of, preventive services and treatment.
- Use of an internationally validated and locally adapted tool strengthens the findings of this study and provides a more comprehensive approach to describing AIDS-related stigmatization by health workers in the study setting than previous studies conducted in Nigeria and sub-Saharan Africa.
- Information provided by this study can help to inform efforts to reduce health system barriers against the elimination of pediatric HIV in Lagos, Nigeria and similar locales in sub-Saharan Africa.
- Self-reported attitudes and behaviors of healthcare workers may be subject to social desirability bias, particularly among those who have previously received AIDS stigma reduction training.
- Experiences of AIDS-related stigmatization and discrimination among PLWHA may be markedly different from those reported by health workers.

INTRODUCTION

With over 3.2 million people infected, Nigeria's HIV epidemic affects all population groups and geographic areas, making the country the second largest in the global burden of the HIV epidemic (1). According to the Joint United Nations Program on AIDS (UNAIDS), Nigeria is one of 22 Global Plan priority countries that account for 90% of pregnant women living with HIV globally (2). Although the country has made some progress in addressing HIV/AIDS, the country still records the largest number of new HIV infections among children each year, accounting for nearly 30% of global pediatric HIV infections in 2014 (3-5). While many countries in sub-Saharan Africa

(SSA) have made significant strides in reducing the burden of pediatric HIV infection, Nigeria failed to meet the 2015 Global Plan target of eliminating new HIV infections among children by 90% and keeping their mothers alive (6).

Available evidence shows that serious barriers against uptake of, and retention in, PMTCT care exist in Nigeria (7, 8). Recent studies have demonstrated the effectiveness of a culturally adapted, faith-based program in increasing HIV counseling, testing, and enrollment in care among pregnant women and their male partners in Nigeria (7, 9, 10). However, analysis of factors influencing refusal to test for HIV has revealed that fear of AIDS-related stigmatization was a major reason for not testing (11). AIDS-related Stigmatization poses barriers at each step of the PMTCT care cascade, and such barriers must be addressed to reduce the burden of pediatric HIV infection in Nigeria. In 2014, Nigeria passed an Anti-Discrimination Act that was intended to reduce AIDS-related stigmatization. As part of a multi-sectoral approach to address AIDS related stigmatization and discrimination, the National Agency for Control of AIDS also developed the National HIV/AIDS Stigma Reduction Strategy as a guide to stakeholders, especially those that implement programs and services at the community level (12). "AIDS-related stigmatization" refers to the prejudice, discounting, discrediting, and discrimination directed at people perceived to be living with HIV or AIDS (13). Duckitt describes two concepts associated with AIDS-related stigmatization: 1) prejudice (the attitude) – an evaluation or judgment toward members of a stigmatized group, which involves emotions of fear, disgust, anger, and contempt; and 2) discrimination (the act) – differential treatment of individuals according to their membership of a stigmatized group (14). Analysis of Nigeria's 2013 Demography and Health Survey showed that nearly 50% of adults (aged 15-49) responded "no" to the question, "Would you buy fresh

vegetables from a shopkeeper or vendor if you knew that this person had HIV?" (15, 16), thus indicating a high prevalence of AIDS-related stigmatization in the society. Although individuals usually learn of their HIV seropositive status at a healthcare facility, healthcare settings are often cited as places where people experience the most direct AIDS-related stigmatization (17). AIDS-related stigma experienced in healthcare settings is particularly concerning since it can directly prevent individuals from seeking prevention and care services. Stigmatizing acts by healthcare workers may include refusal to treat HIV-positive persons, burning the linen of HIV-infected patients, charging HIV-infected patients for the cost of infection control supplies, and early hospital discharge (18-23). Other acts include ward segregation, isolation, lack of confidentiality (sharing information on patients' HIV positive status with hospital workers and other patients), and selective application of "universal" precautions (e.g., use of gloves with only HIV-infected patients) (17-22). A study of AIDS-related stigmatization by primary healthcare workers conducted in in Ilorin, Nigeria (about 180 miles from Lagos) in 2013, revealed that 98% of the health workers reported observing discrimination against persons living with HIV by other health workers (24). In a similar study in neighboring Ghana, health workers who cared for persons living with HIV expressed concerns about secondary stigmatization by family members and friends who know they interact with such patients (25, 26). Some health professionals take extreme caution when treating HIV-positive individuals, exacerbating a medical environment in which AIDS-related stigmatization leads to differential treatment of PLWHA (26).

Lagos recently intensified efforts to scale up PMTCT services through multiple strategies, including training and engagement of primary healthcare center (PHC) personnel. As part of this strategy, PMTCT services were integrated into maternal and child health (MCH) services at the

PHC level in the state. PHC centers represent people's first level of contact with the health system and are typically located near the communities they serve. Task shifting of PMTCT services to PHC centers has the potential to increase access HIV counseling, testing, enrollment and retention in PMTCT services (27). However, in situations where most people know each other, and health workers know and are known by many in the community, confidentiality may be difficult to maintain, thus leading to increased concern about AIDS-related stigmatization. The objective of this study was to assess the extent to which AIDS-related stigmatization existed in PHC centers in Lagos state, Nigeria. It was hoped that evidence from the study would add to the body of information available to inform efforts to reduce health system barriers against the elimination of pediatric HIV in the state.

DESIGN AND METHODS

Study area and setting

The study was conducted in Lagos state, southwest Nigeria. With a population of 13,463 million inhabitants (28), Lagos is the commercial center of both Nigeria and the West African sub-region. The large population and the fluid movement of people in and out of the state, have significant implications for the spread of HIV/AIDS. Lagos has 20 Local Government Areas (LGAs), 37 Local Council Development Areas (LCDAs), and approximately 2,000 communities (29). The HIV prevalence rate among adults is 4.1% - higher than the national average of 3.2% (30). At the end of 2015, an estimated 217,569 individuals (adults and children) were positive for HIV/AIDS in Lagos state (6).

Research design, study population and data collection

This was a cross-sectional survey of PMTCT service providers in PPHC centers in Lagos State, Nigeria. Ethical approval for the study was obtained from the Nigeria Health Research Ethics Commission. Using a geopolitical map, we purposively selected Central and Western Districts of the state for the study. These districts were chosen because they covered the largest areas of Lagos including areas with populations of income levels that are most representative of the state. With approvals from the Lagos State Ministry of Health, the Lagos State AIDS Control Agency (LSACA), and the Lagos State Primary Health Care Board, Medical Officers of Health in the LGAs within the two study districts were contacted with study information and an invitation to participate. Of the 10 LGAs in the Western District, 8 responded and agreed to participate; 2 of the 5 LGAs in the Central District responded and volunteered to participate. Consenting Medical Officers introduced the study team to the Nursing Officers in charge of PMTCT services in the PHCs within their LGAs. Eligible PMTCT workers at each PHC center were then provided with detailed information about the study. Health providers who expressed willingness to participate were asked to sign an informed consent prior to data collection. To ensure confidentiality, each participant was assigned a unique study identification (ID) number. Data were collected from one hundred and sixty-one (161) consenting health workers in thirty-eight (38) PHC centers in ten (10) LGAs in Central and Western Districts of Lagos. Only health workers involved in direct patient care (nurses and nursing assistants) or who had access to information on clients' HIV serostatus (laboratory workers, pharmacists, pharmacy technicians, and medical records personnel) participated. All PMTCT service providers in the 38 PHC centers volunteered to participate in the study except for 20 who were absent (on leave or off-duty) during the time of the survey. Data

were collected by JE and VY between April and August 2017 using direct interviews via REDCap (Research Electronic Data Capture) software (31).

Data collection instrument

Data were collected using the Brief Questionnaire for Measuring AIDS-related stigmatization by health facility staff, developed and validated by the United States Agency for International Development (USAID) (32). An expert consultation by USAID reviewed an item pool of existing AIDS related stigma measures, identified gaps, and prioritized the items. The resulting instrument was field-tested among different levels of health facility staff that works across diverse levels of HIV prevalence, language, and healthcare settings. Field tests analyzed both psychometric properties ($\alpha = 0.78$) and contextual issues (32). The instrument was piloted locally using a purposive sample of ten PMTCT workers in two PHC centers in Lagos. Participants in the pilot study were not included in the main study. Their feedback was used to modify and adapt the instrument as appropriate. Data were collected on (1) participant demographics, (2) discriminatory behaviors, (3) opinions and stigmatizing attitudes towards persons living with HIV/AIDS (PLWHA), and (4) work environment. Variables in demographic information and work-related characteristics included age (≤24, 25-39, 40-55, and 56 or above), gender, professional category (doctor, nurse, laboratory technician, etc.), professional contact with PLWHA (yes or no), number of staff working directly on provision of PMTCT services (1-3, 4-6, 7-9, and >9), number of HIV-positive patients served per week, and HIV-related training status, including training on AIDS-related stigma (yes or no) (Table 1).

Healthcare workers' discriminatory behaviors were grouped into the following domains: extra infection precautions, observed stigmatization, and secondary stigmatization (Table 2). For extra infection precautions and observed stigmatization, the original responses for each statement were 1 (yes), 0 (no), or 777 (I would prefer not to answer or can't remember). A score of 1 was given for a 'yes' response and 0 for 'no,' 'I would prefer not to answer,' or 'can't remember.' For secondary stigmatization, participants responded using a 4-point Likert-type scale that ranged from 0 (*not worried/never*) to 3 (*very worried/most of the time*). Higher scores indicated that the respondent held a stronger discriminatory attitude.

Attitudes towards PLWHA were assessed, using: 5 questions on opinions about people living with HIV, 4 questions concerning fear of contracting HIV infection, 4 questions on willingness to care for key populations, and 15 questions related to health workers' resistance/preference for not treating PLWHA and key populations (Table 3). For opinions about PLWHA, the responses were scored 1 for '*yes*' and 0 for '*no*' or '*don't know.*' For the remaining variables, participants responded using a 4-point Likert-type scale ranging from 0 (*strongly disagree/don't know*) to 3 (*strongly agree*). Higher scores indicated that the respondent held a stronger stigmatizing attitude. Work environment measured policies related to HIV management/support and infection control guidelines/supplies (6 questions). A score of 1 was given for a '*yes*' response if a policy document was observed by the data collector and 0 for '*no*' or '*don't know'* if none was observed. Higher scores indicated greater health facility policies and procedures (Table 4).

Data analysis

All analyses were performed using STATA statistical software (Version 14, Stata Corp; College Station, TX). Descriptive statistics were used to describe healthcare workers' demographic characteristics, professional cadre, professional contact with PLWHA, number of HIV-positive patients served per week, HIV-related training experiences, HIV-related discriminatory behaviors and stigmatizing attitudes, and presence of institutional policies and procedures. Pearson correlation coefficients were calculated to assess the relationship between professional resistance to treat PLWHA and key populations, negative emotions towards people with HIV, negative opinions about key populations, fear of contagion, observed stigmatization, secondary stigmatization, HIV training, institutional policies, work environment, and demographic variables such as age and gender. Furthermore, three multiple regression analyses were conducted to examine associations among level of discrimination at work, stigmatizing attitudes, and presence of institutional policies and procedures, controlling for the simultaneous effects of participant age, gender, professional cadre, personal contact with PLWHA, and HIV-related training experiences. We tried to answer the following question: How were healthcare workers' demographics, work and HIV training, and perceived infection risk at work associated with their stigmatizing attitudes and work environments? Regression coefficient estimations and their significant levels are described. The following key major assumptions were tested and confirmed to be satisfactory prior to the analyses: normality, linearity, absence of multicollinearity, and homoscedasticity.

Patient and public involvement

Patients or members of the public were not involved in the design, conduct, or dissemination of this study.

RESULTS

Respondent characteristics

As shown in Table 1, most respondents (83.8%) were females aged 25-39 years (48.7%) or 40-55 (40.6%). Professional cadres represented in the survey included 44 nurses/midwives (27.7%), 30 community health extension workers (18.9%), and 24 laboratory personnel (15.1%). Sixty-nine percent of the respondents reported having direct contact with HIV-positive individuals, averaging two contacts per week. Most respondents (74.5%) indicated having received previous training on informed consent and confidentiality, and on infection control and universal precautions (70.8%). Sixty percent reported receiving training on AIDS-related stigmatization.

Table 1: Demographic and work-related characteristics of respondents*

Baseline characteristics	No	%
Age group (in years) (n=160)		
≤24	10	6.25
25-39	78	**48.75**
40-55	65	**40.63**
56 and above	7	4.38
Gender (n=161)		
Male	26	16.15
Female	135	**83.85**
Profession (n=159)		
Laboratory Technician / Scientist	24	**15.09**
Medical Records Personnel	22	13.84
Comm. Health Extension Worker	30	**18.87**
Nurse / Mid-Wife	44	**27.67**
Pharmacist	17	10.69
Database operator	2	1.26
Counseling Specialist	11	6.92
Other**	9	5.66
Personal contact with PLWHA (n=159)		
Yes	110	**69.18**
No	49	30.82
Number of staff working directly on provision of PMTCT (n=160)		
1-3	50	31.25
4-6	65	40.63
7-9	26	16.25
>9	19	11.88

Number of HIV-positive patients served per week (n=161), median (IQR)	2	3
Training (n=161)		
HIV stigma and discrimination	96	59.63
Infection control and universal precautions (including post-exposure prophylaxis)	114	**70.81**
Patients' informed consent, privacy and confidentiality	120	**74.53**
Key population stigma and discrimination	93	57.76

n = number of responses; PMTCT = Prevention of mother-to-child transmission; IQR = interquartile range
*Some respondents left some questions with blanks or no answers; these were not included in the number of responses for the specific question.
**Other profession comprises accountants, cashiers, and administrators.

Discriminatory behaviors

As shown in Table 2, a majority of respondents (80%) had not encountered another healthcare worker who was unwilling to care for a PLWHA, witnessed provision of poor-quality services to PLWHA, or witnessed other healthcare workers talking badly about PLWHA. However, 39% reported wearing double gloves, and 41% used other special infection-control measures when providing services to PLWHA. Regarding secondary stigmatization, participants reported low levels of enacted secondary stigmatization and low levels of anticipated secondary stigmatization. More than 85% were neither worried about people talking badly about them because of their work with PLWHA, nor concerned about friends and family or colleagues avoiding them. Most did not experience people talking badly about them (83%) and had not been avoided by friends and family (93%) or colleagues (93%) because they cared for PLWHA.

Table 2: HIV-related discriminatory behaviors among healthcare workers* (n=161)

Variables	Yes n(%)	No n(%)	No opinion n(%)
Extra infection precautions			
Avoid physical contact	18 (11.18)	**140(86.96)**	3(1.86)
Wear double gloves	**62 (38.51)**	**95(59.01)**	4(2.48)
Use any special infection-control measures with PLWHA that you usually do not use	**66 (40.99)**	**90(55.9)**	5(3.11)
Observed stigma			
Workers unwilling to care for a patient living with or thought to be living with HIV	21 (13.04)	**134(83.23)**	6(3.73)
Workers providing poorer quality of care to patients with or thought to be living with HIV	14(8.70)	**137(85.09)**	10(6.21)
Healthcare workers talking badly about people with or thought to be living with HIV	7 (4.35)	**150(93.17)**	4(2.48)
Secondary stigma**			
Worried about people talking badly about you because you care for PLWHA	21 (13.04)	**140(86.96)**	
Worried about friends and family avoiding you because you care for PLWHA	22 (13.66)	**139(86.34)**	
Worried about colleagues avoiding you because of your work caring for PLWHA	9 (5.59)	**152(94.41)**	
Experienced people talking badly about you because you care for PLWHA	28 (17.39)	**133 (82.61)**	
Been avoided by friends and family because you care for PLWHA	12 (7.45)	**149(92.55)**	
Been avoided by colleagues because of your work caring for PLWHA	11 (6.88)	**149(93.13)**	

n = number of responses; PMTCT = Prevention of mother-to-child transmission; IQR = interquartile range
*Some respondents left some responses blank; these were not included in the number of responses for the specific question.
** For consistency within the scale, "strongly agree" and "agree" were collapsed into a "yes" category and "strongly disagree" and "disagree" were collapsed into a "no" category; "once or twice," "several times," and "most of the time" were also collapsed into a "yes" category, and "never" were collapsed into a "no" category.

Attitudes towards PLWHA

A small proportion (18-24%) of respondents indicated that they would prefer not to provide services to PLWHA or key populations (Table 3). Similarly, a small proportion of the respondents expressed concern about HIV transmission through drawing blood from (31%) or dressing wounds of (25%) PLWHA. Less than half (40%) of the respondents believed that most PLWHA did not care if they infected other people while very few (26%) believed that most PLWHA had multiple

sexual partners or engaged in irresponsible behaviors (19%). Importantly, 94% agreed that women living with HIV should be allowed to have babies if they wished (Table 3).

When asked about occupational safety, 46% believed HIV/AIDS made their jobs risky. A similar proportion thought it was best to train a few specialists who would be responsible for treating PLWHA, and 32% expressed fear of contracting HIV while on the job. Twenty-two per cent would prefer to refer persons with HIV or AIDS to their professional colleagues, and 19% would rather not have those perceived to be at high risk for HIV/AIDS (e.g., persons who inject drugs or men who have sex with men) as patients. Although 50% of respondents would not eat at restaurant where the chef had HIV or AIDS, 82% admitted that they often had tender, concerned feelings for PLWHA (Table 3).

Table 3: Stigmatizing attitudes and opinions of healthcare workers (n=161)

Variables	Yes n(%)	No n(%)	No opinion n(%)
Opinions about people living with HIV			
Most people living with HIV do not care if they infect other people.	**65(40.37)**	50(31.06)	46(28.57)
People living with HIV should feel ashamed of themselves.	12(7.45)	143(88.82)	6(3.73)
Most people living with HIV have had many sexual partners.	**42(26.09)**	75(46.58)	44(27.33)
People get infected with HIV because they engage in irresponsible behaviors.	**31(19.25)**	108(67.08)	22(13.66)
Women living with HIV should be allowed to have babies if they wish.	**152(94.41)**	8(4.97)	1(0.62)
Fear of contracting HIV infection			
Worried about touching the clothing or bedding of a PLWHA	12(7.45)	144(89.44)	5(3.11)
Worried about dressing the wounds of a PLWHA	**40(24.84)**	110(68.32)	11(6.83)
Worried about drawing blood from a PLWHA	**50(31.06)**	101(62.75)	10(6.21)
Worried about taking the temperature of a patient living with HIV	5(3.11)	148(91.93)	8(4.97)
Willing to care for key populations			
Prefer not to provide services to people who inject illegal drugs.	**36(22.36)**	105(65.22)	20(12.42)
Prefer not to provide services to men who have sex with men.	**39(24.22)**	101(62.73)	21(13.04)
Prefer not to provide services to female sex workers	**30(18.63)**	116(72.05)	15(9.32)
Prefer not to provide services to male sex workers	**32(19.88)**	114(70.81)	15(9.32)
Professional resistance			
HIV/AIDS makes my job as a health worker to be a risky occupation.	**74(45.96)**	83(51.55)	4(2.48)
Afraid of catching HIV because of my job in providing care for PLWHA.	**52(32.30)**	108(67.08)	1(0.62)
Do not want my child to go to a school with a child with HIV/AIDS.	14(8.70)	141(87.58)	6(3.73)
Willing to eat in a restaurant where I know the chef has HIV/AIDS.	70(43.48)	**81(50.31)**	10(6.21)
Fear of becoming infected with HIV if working with HIV/AIDS patients over a long period of time.	15(9.32)	144(89.44)	2(1.24)
Rather work with a better class of people than HIV/AIDS patients.	13(8.07)	139(86.33)	9(5.59)
Prefer to refer PLWHA to my professional colleagues.	**35(21.74)**	121(75.15)	5(3.11)
Prefer not to work with HIV or AIDS patients.	18(11.18)	139(86.33)	4(2.48)
Consider changing my profession specialty/position if it becomes necessary.	6(3.73)	152(94.41)	3(1.86)
Best to train a few specialists who would be responsible for treatment of AIDS patients.	**68(42.24)**	92(57.14)	1(0.62)
Won't treat those at high risk of HIV/AIDS, such as people who inject drugs and men who have sex with men, as patients.	31(19.25)	119(73.91)	11(6.83)
Sometimes find it hard to be sympathetic to patients living with HIV and AIDS.	28(17.39)	125(77.64)	8(4.97)
Resentful if HIV/AIDS patients accounted for a significant part of my caseload.	21(13.13)	116(72.5)	23(14.38)
Often have tender, concerned feelings for people living with HIV or AIDS.	**132(81.99)**	22(13.66)	7(4.35)
Reluctant healthcare workers to work alongside a co-worker living with HIV.	6(3.73)	120(74.53)	35(21.74)

Health facility policies and procedures

As shown in Table 4, most of the health facilities (>75%) had documented policies that aim to protect PLWHA from AIDS-related stigmatization, including policies on HIV counseling and testing. Eighty-six percent of the respondents were aware that they could not test patients for HIV

without their knowledge, and 83% indicated that they would get in trouble at work if they were found to discriminate against a PLWHA. Thirty percent of the respondents noted that they did not have adequate supplies to reduce the risk of becoming infected with HIV.

Table 4: Health facility policies and procedures (n=161)

Variables	Yes	No	No opinion
Policies to HIV management/support			
Policy on HIV testing	**124(77.02)**	20(12.42)	17(10.56)
Test a patient for HIV without their knowledge	21(13.04)	**139(86.34)**	1(0.62)
Get in trouble at work if discriminate against patients living with HIV	**132(82.50)**	15(9.38)	13(8.13)
Written guidelines to protect patients living with HIV from discrimination	**133(82.61)**	18(11.18)	10(6.21)
Infection control guidelines/supplies			
Adequate supplies that reduce risk of becoming infected with HIV	**104(64.60)**	48(29.81)	9(5.59)
Standardized procedures/protocols that reduce risk of becoming infected with HIV	**130(80.75)**	22(13.66)	9(5.59)

Correlation coefficients of the identified variables

As shown in Table 5, opinions about PLWHA were significantly associated with willingness to care for PLWHA ($r = 0.28$, $p < 0.001$), professional resistance ($r = 0.37$, $p < 0.001$), and quality of healthcare policies and procedures ($r = 0.23$, $p < 0.01$). Fear of contracting HIV infection was significantly associated with professional resistance ($r = 0.34$, $p < 0.001$), which was significantly correlated with preference not to care for PLWHA ($r = 0.28$, $p < 0.001$). In terms of socio-demographic variables, age was significantly correlated with opinions of healthcare workers about PLWHA ($r = 0.17$, $p < 0.05$) and healthcare policies and procedures ($r = 0.28$, $p < 0.001$). Providers who received HIV training had less fear of contracting HIV infection ($r = -0.21$, $p < 0.01$) and were less professionally resistant ($r = -0.18$, $p < 0.05$).

Table 5: Correlation Coefficients among Selected Variables

N°	Domains[a]	1	2	3	4	5	6	7	8	9	10
1	Discriminatory behaviors at work	1.00									
2	Opinions about people living with HIV	0.21[b]	1.00								
3	Fear of contracting HIV infection	0.16[c]	0.11	1.00							
4	Willing to care for key populations	0.14	0.28[a]	0.08	1.00						
5	Professional resistance	0.32[a]	0.37[a]	0.34[a]	0.28[a]	1.00					
6	Healthcare policies and procedures	-0.09	0.23[b]	-0.01	0.06	0.04	1.00				
7	Age	-0.08	0.17[c]	0.06	0.11	0.10	0.28[a]	1.00			
8	Gender	0.04	0.09	0.04	-0.06	0.01	0.13	-0.01	1.00		
9	Contact with PLWHA	0.11	0.10	-0.04	-0.05	-0.09	0.08	0.24[b]	0.24[b]	1.00	
10	Training	-0.06	0.04	-0.21[b]	0.13	-0.18[c]	0.24[b]	0.05	-0.06	0.11	1.00

a **Domains**: Different domains were generated from previous tables:
Discriminatory behaviors at work (Table 2) = Extra infection precautions +Observed stigma +Secondary stigma
Opinions about people living with HIV (Table 3) = Most people living with HIV do not care if they infect other people+….+ Women living with HIV should be allowed to have babies if they wish.
Healthcare policies and procedures (Table 4**)** = Policies to HIV management/support + Infection control guidelines/supplies
Training (table 1)=HIV stigma and discrimination + Infection control and universal precautions (including post-exposure prophylaxis)+Patients' informed consent, privacy and confidentiality + stigmatization against key populations.
b $p < 0.001$.
c $p < 0.01$.
d $p < 0.05$.

Multivariate results

Results of multiple regression analyses (Table 6) show that health workers' HIV training and perceived on-the-job infection risk were important predictors of stigmatizing attitudes. Health workers who had received HIV-related training tended to report significantly less stigmatizing attitudes ($\beta = -0.10$), and those who perceived higher infection risk at work were more likely to display higher levels of stigmatizing attitudes ($\beta = 0.84$).

HIV training was the most important predictor of perceived institutional support ($\beta = 0.21$). In addition, older respondents were shown to report stronger institutional support of their work with PLWHA ($\beta = 0.57$). In the final and complete regression model of discrimination at work, opinions and stigmatizing attitudes against PLWHA were the most important factors in predicting

discrimination at work, as the stronger the stigmatizing attitudes, the more frequent or intense the discrimination ($\beta = 0.13$).

Table 6: Estimates results from multivariate regression analysis

Variable	Stigmatizing attitudes	Health facility policies and procedures	Discriminatory behaviors
	n=157	n=157	n=156
Age	**1.52**[b]	**0.57**[a]	**-0.60**[b]
Sex	0.25	0.58	0.002
Profession	-0.02	-0.10	0.0001
Personal contact with PLWHA	-1.33	-0.10	**1.12**[b]
HIV training	**-0.10**[b]	**0.21**[c]	-0.07
Fear of HIV infection	**0.84**[c]		0.03
Attitudes towards PLWHA and key populations			**0.13**[a]
Health facility policies and procedures			-0.16
R^2	0.13	0.17	0.15

[a] $p < 0.001$.
[b] $p < 0.05$.
[c] $p < 0.01$.

DISCUSSION

Although AIDS-related stigmatization poses significant risk to the physical and psychosocial well-being of PLWHA, our current understanding of the extent of the problem among healthcare providers working within primary healthcare centers in Nigeria is based on a few studies (24, 33). The current study of primary health centers in Lagos, Nigeria helps fill this knowledge gap by examining PMTCT service providers' stigmatizing attitudes, perceived risk of infection, and discriminatory behaviors towards patients living with HIV.

Contrary to earlier studies of HIV/AIDS stigmatization in the healthcare setting in Nigeria and elsewhere (24, 33, 34), our study revealed low levels of AIDS-related stigmatization by health workers who provide PMTCT services in Lagos. Overall, we found low levels of secondary

stigmatization and fewer negative attitudes and opinions towards PLWHA. We also found that most health facilities had policies and procedures that dealt with informed consent, confidentiality, and anti-discriminatory practices. Our analysis revealed that HIV training of PMTCT service providers was associated with reduced perception of risk of HIV infection and less stigmatizing attitudes and opinions against PLWHA.

The generally low levels of AIDS-related stigmatization observed among the study participants could be explained by several factors. First, as antiretroviral therapy (ART) becomes more widely available, stigmatizing attitudes may decrease in the population in general and among health workers. Poor access to care has been associated with AIDS-related stigma (35); analysis of Demography and Health Survey (DHS) data from eighteen countries in sub- Saharan Africa found that for every 10-percentage-point increase in proportion of PLWHA on ART, -reported HIV stigmatization decreased 2.3 to 2.8 percentage points (36). Health workers may feel more empowered, less burdened, and less resentful towards PLWHA, when they have the means to provide treatment to them. Earlier studies have shown that lack of available resources and treatment for HIV patients in healthcare settings was associated with an increased sense of despair among health workers, resentment towards HIV patients, and feelings of vulnerability to infection (33, 34, 37). In January 2017, Nigeria adopted the 90-90-90 plan announced by the Joint United Nations Program (UNAIDS) to ensure that: by 2020, 90% of all people living with HIV will know their HIV status; 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy (ART); and 90% of all people receiving ART will have viral suppression. Although there is still huge unmet need for ART in about a third of the states, the number of persons currently on ART has increased from less than 25% in 2014 to 30% in 2017 (38). Second,

the Lagos state government and the US implementing partners, including the Centers for Disease Control and Prevention (CDC), the US Agency for International Development (USAID), and other local and US non-governmental agencies are actively overseeing PMTCT implementation. In fact, during field data collection, we witnessed several PHC centers that were implementing training sessions facilitated by partner agencies. Extensive literature supports the association between HIV/AIDS training and awareness and (1) decreased fear of contagion and (2) reduced AIDS-related stigmatization (34, 39-41). Third, we found that most of the health workers were aware of the HIV/AIDS policies at their centers. Participants noted that they would be disciplined if they were discovered engaging in behaviors that were contrary to policy provisions. HIV anti-discriminatory policies in healthcare settings have been shown to be positively associated with reduced stigmatization and discrimination against PLWHA by health workers (39).

While government oversight and supporting partnerships are encouraging, it should be noted that 30% of the respondents indicated that they did not have adequate supplies to reduce their risk of becoming infected with HIV. The shortage of supplies to support universal safety measures is a common challenge in many healthcare facilities in low- and middle-income countries (42, 43), potentially leading to avoidance of PLWHA (44), and contributing to a preference not to provide services to PLWHA and key populations. During data collection visits, we noted that most of the primary healthcare centers were not supplied with electricity, a perennial problem in Nigeria. Each PHC center received roughly ten thousand naira (30 US$) monthly for gasoline to power standby generators; however, in Nigeria, gasoline is expensive and often in short supply. We observed instances in which health workers contributed money out-of-pocket to purchase gasoline for their standby generators. At night, many facilities also used rechargeable battery-powered emergency

lanterns, including in delivery rooms. Such work conditions could have implications for job dissatisfaction, resulting in discrimination against PLWHA.

Strengths of the study

This study has several notable strengths. First, we used a reliable standardized instrument for assessing AIDS-related stigmatization within the healthcare setting that incorporates relevant constructs and demonstrated discriminant validity (17). Second, this study supports the utility of the USAID instrument in assessing AIDS-related stigmatization in primary healthcare centers and related non-hospital settings in low-income countries. Third, unlike previous studies, our analysis identified factors that mediate AIDS-related stigmatization in the primary healthcare centers, including training and policies. As countries continue to implement task-shifting of services to increase access to antiretroviral treatment, further studies should assess the relationship between AIDS-related stigmatization in primary healthcare centers and uptake of counseling, testing, enrollment into care, and retention.

Limitations

Findings from this study were based on self-reported stigmatizing attitudes and discriminatory behavior, and may therefore, be subject to social desirability bias (45). The questions on discriminatory behavior, however, provided an opportunity for respondents to indicate observance of discrimination against PLWHA by other workers, a measure that would presumably be less prone to social desirability bias than evaluation of their own behavior. Still, the reported discrimination was low. Future studies of stigmatization by healthcare workers would benefit from use of direct observation and patient-reported measures to explore whether providers' perceptions

of their attitudes and actions are in alignment with patients' and third-party observers' accounts. Even in the absence of such information, providers' perceptions can be used to inform the development of provider trainings that are responsive to the proficiencies and deficits that providers have identified for themselves.

Results of this study showed that most of the participants were female and nurses. In healthcare facilities in Nigeria, most healthcare workers are nurses, who are usually female. This sample is in accordance with the expected population of healthcare workers in public health facilities in Nigeria. A study conducted by Andrewin and Chien in Belize showed that females and non-religious healthcare workers showed more stigmatizing behavior in attitudes of blame/judgment (20). However, in the present study, we did not demonstrate that gender influenced stigmatization by health workers, and we know of no cultural norms that would suggest otherwise. Nevertheless, future studies to investigate the influence of gender on stigmatizing attitudes and behaviors among healthcare workers may be important. We also did not have enough cadres of other health workers to facilitate an investigation of whether stigmatizing behaviors varied by professional cadre.

CONCLUSIONS

This study provides information that can be cascaded into an overall strategy to reduce AIDS-related stigmatization in the healthcare setting. There is a need to further elucidate issues related to professional resistance and fear of HIV infection among the healthcare workers. Issues related to health workers values and professional ethics also deserve attention. Since personal attributes predict stigmatizing behavior, the values and beliefs of healthcare workers should be explored and

integrated into future AIDS stigma trainings. The finding regarding attitudes towards care provision for key populations also calls for emphasis on professional codes of conduct and ethical provision of care to all deserving clients, irrespective of their status in society or other personal attributes.

Finally, it is important to have documented policies that reduce stigmatization against PLWHA in the healthcare setting. However, such policies should be supported with the provision of basic resources for infection control. This may help to reassure healthcare workers of government's commitment to the health and safety of health workers and may help to address fear of contagion and professional resistance to care for individuals that are perceived to be at high risk for HIV.

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AIDS-Related Stigmatization in the Healthcare Setting: A Study of Primary Healthcare Centers that Provide Services for Prevention of Mother-to-Child Transmission of HIV in Lagos, Nigeria

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AIDS-Related Stigmatization in the Healthcare Setting: A Study of Primary Healthcare Centers that Provide Services for Prevention of Mother-to-Child Transmission of HIV in Lagos, Nigeria

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AIDS-Related Stigmatization in the Healthcare Setting: A Study of Primary Healthcare Centers that Provide Services for Prevention of Mother-to-Child Transmission of HIV in Lagos, Nigeria

ABSTRACT

Objective: To assess AIDS stigmatizing attitudes and behaviors by PMTCT service providers in primary healthcare centers in Lagos, Nigeria.

Design: Cross-sectional survey.

Setting: Thirty-eight primary healthcare centers in Lagos, Nigeria.

Participants: One hundred sixty-one (161) PMTCT service providers.

Outcome measures: PMTCT service providers' discriminatory behaviors, opinions, and stigmatizing attitudes towards persons living with HIV/AIDS (PLWHA), and nature of the work environment (HIV/AIDS-related policies, and infection control guidelines/supplies).

Results: Observed AIDS-related stigmatization was low: few respondents (4%) reported hearing co-workers talk badly about PLWHA or observed provision of poor-quality care to PLWHA (15%). Health workers were not worried about secondary AIDS stigmatization due to their occupation (86%). Opinions about PLWHA were generally supportive; providers strongly agreed that women living with HIV should be allowed to have babies if they wished (94%). PMTCT service providers knew that consent was needed prior to HIV testing (86%) and noted that they would get in trouble at work if they discriminated against PLWHA (83%). A minority reported discriminatory attitudes and behaviors; 39% reported wearing double gloves, and 41% used other special infection-control measures when providing services to PLWHA. Discriminatory behaviors were correlated with negative opinions about PLWHA ($r = 0.21$, $p < 0.01$), fear of HIV infection ($r = 0.16$, $p < 0.05$), and professional resistance ($r = 0.32$, $p < 0.001$). Those who received HIV training had less fear of contagion.

Conclusions: This study documented generally low levels of AIDS-related stigmatization by PMTCT service providers in primary health care centers in Lagos. Policies that reduce stigmatization against PLWHA in the healthcare setting should be supported with the provision of basic resources for infection control. This may reassure healthcare workers of their safety, thus, reducing their fear of contagion and professional resistance to care for individuals that are perceived to be at high risk for HIV.

ARTICLE SUMMARY

Strengths and limitations of the study

- Understanding healthcare workers' attitudes, behaviors, and perceived risk of HIV infection can inform policies and practices to reduce stigma-related barriers for PLWHA in healthcare settings, thereby improving access to, and quality of, preventive services and treatment.
- Use of an internationally validated and locally adapted tool strengthens the findings of this study and provides a more comprehensive approach to describing AIDS-related stigmatization by health workers in the study setting than previous studies conducted in Nigeria and sub-Saharan Africa.
- Information provided by this study can help to inform efforts to reduce health system barriers against the elimination of pediatric HIV in Lagos, Nigeria and similar locales in sub-Saharan Africa.
- Self-reported attitudes and behaviors of healthcare workers may be subject to social desirability bias, particularly among those who have previously received AIDS stigma reduction training.
- Experiences of AIDS-related stigmatization and discrimination among PLWHA may be markedly different from those reported by health workers.

INTRODUCTION

With over 3.2 million people infected, Nigeria's HIV epidemic affects all population groups and geographic areas, making the country the second largest in the global burden of the HIV epidemic (1). According to the Joint United Nations Program on AIDS (UNAIDS), Nigeria is one of 22 Global Plan priority countries that account for 90% of pregnant women living with HIV globally (2). Although the country has made some progress in addressing HIV/AIDS, the country still records the largest number of new HIV infections among children each year, accounting for nearly 30% of global pediatric HIV infections in 2014 (3-5). While many countries in sub-Saharan Africa

(SSA) have made significant strides in reducing the burden of pediatric HIV infection, Nigeria failed to meet the 2015 Global Plan target of eliminating new HIV infections among children by 90% and keeping their mothers alive (6).

Available evidence shows that serious barriers against uptake of, and retention in, PMTCT care exist in Nigeria (7, 8). Recent studies have demonstrated the effectiveness of a culturally adapted, faith-based program in increasing HIV counseling, testing, and enrollment in care among pregnant women and their male partners in Nigeria (7, 9, 10). However, analysis of factors influencing refusal to test for HIV has revealed that fear of AIDS-related stigmatization was a major reason for not testing (11). AIDS-related Stigmatization poses barriers at each step of the PMTCT care cascade, and such barriers must be addressed to reduce the burden of pediatric HIV infection in Nigeria. In 2014, Nigeria passed an Anti-Discrimination Act that was intended to reduce AIDS-related stigmatization. As part of a multi-sectoral approach to address AIDS related stigmatization and discrimination, the National Agency for Control of AIDS also developed the National HIV/AIDS Stigma Reduction Strategy as a guide to stakeholders, especially those that implement programs and services at the community level (12). "AIDS-related stigmatization" refers to the prejudice, discounting, discrediting, and discrimination directed at people perceived to be living with HIV or AIDS (13). Duckitt describes two concepts associated with AIDS-related stigmatization: 1) prejudice (the attitude) – an evaluation or judgment toward members of a stigmatized group, which involves emotions of fear, disgust, anger, and contempt; and 2) discrimination (the act) – differential treatment of individuals according to their membership of a stigmatized group (14). Analysis of Nigeria's 2013 Demography and Health Survey showed that nearly 50% of adults (aged 15-49) responded "no" to the question, "Would you buy fresh

vegetables from a shopkeeper or vendor if you knew that this person had HIV?" (15, 16), thus indicating a high prevalence of AIDS-related stigmatization in the society. Although individuals usually learn of their HIV seropositive status at a healthcare facility, healthcare settings are often cited as places where people experience the most direct AIDS-related stigmatization (17). AIDS-related stigma experienced in healthcare settings is particularly concerning since it can directly prevent individuals from seeking prevention and care services. Stigmatizing acts by healthcare workers may include refusal to treat HIV-positive persons, burning the linen of HIV-infected patients, charging HIV-infected patients for the cost of infection control supplies, and early hospital discharge (18-23). Other acts include ward segregation, isolation, lack of confidentiality (sharing information on patients' HIV positive status with hospital workers and other patients), and selective application of "universal" precautions (e.g., use of gloves with only HIV-infected patients) (17-22). A study of AIDS-related stigmatization by primary healthcare workers conducted in in Ilorin, Nigeria (about 180 miles from Lagos) in 2013, revealed that 98% of the health workers reported observing discrimination against persons living with HIV by other health workers (24). In a similar study in neighboring Ghana, health workers who cared for persons living with HIV expressed concerns about secondary stigmatization by family members and friends who know they interact with such patients (25, 26). Some health professionals take extreme caution when treating HIV-positive individuals, exacerbating a medical environment in which AIDS-related stigmatization leads to differential treatment of PLWHA (26).

Lagos recently intensified efforts to scale up PMTCT services through multiple strategies, including training and engagement of primary healthcare center (PHC) personnel. As part of this strategy, PMTCT services were integrated into maternal and child health (MCH) services at the

PHC level in the state. PHC centers represent people's first level of contact with the health system and are typically located near the communities they serve. Task shifting of PMTCT services to PHC centers has the potential to increase access HIV counseling, testing, enrollment and retention in PMTCT services (27). However, in situations where most people know each other, and health workers know and are known by many in the community, confidentiality may be difficult to maintain, thus leading to increased concern about AIDS-related stigmatization. The objective of this study was to assess the extent to which AIDS-related stigmatization existed in PHC centers in Lagos state, Nigeria. It was hoped that evidence from the study would add to the body of information available to inform efforts to reduce health system barriers against the elimination of pediatric HIV in the state.

DESIGN AND METHODS

Study area and setting

The study was conducted in Lagos state, southwest Nigeria. With a population of 13,463 million inhabitants (28), Lagos is the commercial center of both Nigeria and the West African sub-region. The large population and the fluid movement of people in and out of the state, have significant implications for the spread of HIV/AIDS. Lagos has 20 Local Government Areas (LGAs), 37 Local Council Development Areas (LCDAs), and approximately 2,000 communities (29). The HIV prevalence rate among adults is 4.1% - higher than the national average of 3.2% (30). At the end of 2015, an estimated 217,569 individuals (adults and children) were positive for HIV/AIDS in Lagos state (6).

Research design, study population and data collection

This was a cross-sectional survey of PMTCT service providers in PPHC centers in Lagos State, Nigeria. Ethical approval for the study was obtained from the Nigeria Health Research Ethics Commission. Using a geopolitical map, we purposively selected Central and Western Districts of the state for the study. These districts were chosen because they covered the largest areas of Lagos including areas with populations of income levels that are most representative of the state. With approvals from the Lagos State Ministry of Health, the Lagos State AIDS Control Agency (LSACA), and the Lagos State Primary Health Care Board, Medical Officers of Health in the LGAs within the two study districts were contacted with study information and an invitation to participate. Of the 10 LGAs in the Western District, 8 responded and agreed to participate; 2 of the 5 LGAs in the Central District responded and volunteered to participate. Consenting Medical Officers introduced the study team to the Nursing Officers in charge of PMTCT services in the PHCs within their LGAs. Eligible PMTCT workers at each PHC center were then provided with detailed information about the study. Health providers who expressed willingness to participate were asked to sign an informed consent prior to data collection. To ensure confidentiality, each participant was assigned a unique study identification (ID) number. Data were collected from one hundred and sixty-one (161) consenting health workers in thirty-eight (38) PHC centers in ten (10) LGAs in Central and Western Districts of Lagos. Only health workers involved in direct patient care (nurses and nursing assistants) or who had access to information on clients' HIV serostatus (laboratory workers, pharmacists, pharmacy technicians, and medical records personnel) participated. All PMTCT service providers in the 38 PHC centers volunteered to participate in the study except for 20 who were absent (on leave or off-duty) during the time of the survey. Data

were collected by JE and VY between April and August 2017 using direct interviews via REDCap (Research Electronic Data Capture) software (31).

Data collection instrument

Data were collected using the Brief Questionnaire for Measuring AIDS-related stigmatization by health facility staff, developed and validated by the United States Agency for International Development (USAID) (32). An expert consultation by USAID reviewed an item pool of existing AIDS related stigma measures, identified gaps, and prioritized the items. The resulting instrument was field-tested among different levels of health facility staff that works across diverse levels of HIV prevalence, language, and healthcare settings. Field tests analyzed both psychometric properties ($\alpha = 0.78$) and contextual issues (32). The instrument was piloted locally using a purposive sample of ten PMTCT workers in two PHC centers in Lagos. Participants in the pilot study were not included in the main study. Their feedback was used to modify and adapt the instrument as appropriate. Data were collected on (1) participant demographics, (2) discriminatory behaviors, (3) opinions and stigmatizing attitudes towards persons living with HIV/AIDS (PLWHA), and (4) work environment. Variables in demographic information and work-related characteristics included age (≤24, 25-39, 40-55, and 56 or above), gender, professional category (doctor, nurse, laboratory technician, etc.), professional contact with PLWHA (yes or no), number of staff working directly on provision of PMTCT services (1-3, 4-6, 7-9, and >9), number of HIV-positive patients served per week, and HIV-related training status, including training on AIDS-related stigma (yes or no) (Table 1).

Healthcare workers' discriminatory behaviors were grouped into the following domains: extra infection precautions, observed stigmatization, and secondary stigmatization (Table 2). For extra infection precautions and observed stigmatization, the original responses for each statement were 1 (yes), 0 (no), or 777 (I would prefer not to answer or can't remember). A score of 1 was given for a 'yes' response and 0 for 'no,' 'I would prefer not to answer,' or 'can't remember.' For secondary stigmatization, participants responded using a 4-point Likert-type scale that ranged from 0 (*not worried/never*) to 3 (*very worried/most of the time*). Higher scores indicated that the respondent held a stronger discriminatory attitude.

Attitudes towards PLWHA were assessed, using: 5 questions on opinions about people living with HIV, 4 questions concerning fear of contracting HIV infection, 4 questions on willingness to care for key populations, and 15 questions related to health workers' resistance/preference for not treating PLWHA and key populations (Table 3). For opinions about PLWHA, the responses were scored 1 for '*yes*' and 0 for '*no*' or '*don't know.*' For the remaining variables, participants responded using a 4-point Likert-type scale ranging from 0 (*strongly disagree/don't know*) to 3 (*strongly agree*). Higher scores indicated that the respondent held a stronger stigmatizing attitude. Work environment measured policies related to HIV management/support and infection control guidelines/supplies (6 questions). A score of 1 was given for a '*yes*' response if a policy document was observed by the data collector and 0 for '*no*' or '*don't know'* if none was observed. Higher scores indicated greater health facility policies and procedures (Table 4).

Data analysis

All analyses were performed using STATA statistical software (Version 14, Stata Corp; College Station, TX). Descriptive statistics were used to describe healthcare workers' demographic characteristics, professional cadre, professional contact with PLWHA, number of HIV-positive patients served per week, HIV-related training experiences, HIV-related discriminatory behaviors and stigmatizing attitudes, and presence of institutional policies and procedures. Pearson correlation coefficients were calculated to assess the relationship between professional resistance to treat PLWHA and key populations, negative emotions towards people with HIV, negative opinions about key populations, fear of contagion, observed stigmatization, secondary stigmatization, HIV training, institutional policies, work environment, and demographic variables such as age and gender. Furthermore, three multiple regression analyses were conducted to examine associations among level of discrimination at work, stigmatizing attitudes, and presence of institutional policies and procedures, controlling for the simultaneous effects of participant age, gender, professional cadre, personal contact with PLWHA, and HIV-related training experiences. We tried to answer the following question: How were healthcare workers' demographics, work and HIV training, and perceived infection risk at work associated with their stigmatizing attitudes and work environments? Regression coefficient estimations and their significant levels are described. The following key major assumptions were tested and confirmed to be satisfactory prior to the analyses: normality, linearity, absence of multicollinearity, and homoscedasticity.

Patient and public involvement

Patients or members of the public were not involved in the design, conduct, or dissemination of this study.

RESULTS

Respondent characteristics

As shown in Table 1, most respondents (83.8%) were females aged 25-39 years (48.7%) or 40-55 (40.6%). Professional cadres represented in the survey included 44 nurses/midwives (27.7%), 30 community health extension workers (18.9%), and 24 laboratory personnel (15.1%). Sixty-nine percent of the respondents reported having direct contact with HIV-positive individuals, averaging two contacts per week. Most respondents (74.5%) indicated having received previous training on informed consent and confidentiality, and on infection control and universal precautions (70.8%). Sixty percent reported receiving training on AIDS-related stigmatization.

Table 1: Demographic and work-related characteristics of respondents*

Baseline characteristics	**No**	**%**
Age group (in years) (n=160)		
≤24	10	6.25
25-39	78	**48.75**
40-55	65	**40.63**
56 and above	7	4.38
Gender (n=161)		
Male	26	16.15
Female	135	**83.85**
Profession (n=159)		
Laboratory Technician / Scientist	24	**15.09**
Medical Records Personnel	22	13.84
Comm. Health Extension Worker	30	**18.87**
Nurse / Mid-Wife	44	**27.67**
Pharmacist	17	10.69
Database operator	2	1.26
Counseling Specialist	11	6.92
Other**	9	5.66
Personal contact with PLWHA (n=159)		
Yes	110	**69.18**
No	49	30.82
Number of staff working directly on provision of PMTCT (n=160)		
1-3	50	31.25
4-6	65	40.63
7-9	26	16.25
>9	19	11.88

Number of HIV-positive patients served per week (n=161), median (IQR)	2	3
Training (n=161)		
HIV stigma and discrimination	96	59.63
Infection control and universal precautions (including post-exposure prophylaxis)	114	**70.81**
Patients' informed consent, privacy and confidentiality	120	**74.53**
Key population stigma and discrimination	93	57.76

n = number of responses; PMTCT = Prevention of mother-to-child transmission; IQR = interquartile range
*Some respondents left some questions with blanks or no answers; these were not included in the number of responses for the specific question.
**Other profession comprises accountants, cashiers, and administrators.

Discriminatory behaviors

As shown in Table 2, a majority of respondents (80%) had not encountered another healthcare worker who was unwilling to care for a PLWHA, witnessed provision of poor-quality services to PLWHA, or witnessed other healthcare workers talking badly about PLWHA. However, 39% reported wearing double gloves, and 41% used other special infection-control measures when providing services to PLWHA. Regarding secondary stigmatization, participants reported low levels of enacted secondary stigmatization and low levels of anticipated secondary stigmatization. More than 85% were neither worried about people talking badly about them because of their work with PLWHA, nor concerned about friends and family or colleagues avoiding them. Most did not experience people talking badly about them (83%) and had not been avoided by friends and family (93%) or colleagues (93%) because they cared for PLWHA.

Table 2: HIV-related discriminatory behaviors among healthcare workers* (n=161)

Variables	Yes n(%)	No n(%)	No opinion n(%)
Extra infection precautions			
Avoid physical contact	18 (11.18)	**140(86.96)**	3(1.86)
Wear double gloves	**62 (38.51)**	**95(59.01)**	4(2.48)
Use any special infection-control measures with PLWHA that you usually do not use	**66 (40.99)**	**90(55.9)**	5(3.11)
Observed stigma			
Workers unwilling to care for a patient living with or thought to be living with HIV	21 (13.04)	**134(83.23)**	6(3.73)
Workers providing poorer quality of care to patients with or thought to be living with HIV	14(8.70)	**137(85.09)**	10(6.21)
Healthcare workers talking badly about people with or thought to be living with HIV	7 (4.35)	**150(93.17)**	4(2.48)
Secondary stigma**			
Worried about people talking badly about you because you care for PLWHA	21 (13.04)	**140(86.96)**	
Worried about friends and family avoiding you because you care for PLWHA	22 (13.66)	**139(86.34)**	
Worried about colleagues avoiding you because of your work caring for PLWHA	9 (5.59)	**152(94.41)**	
Experienced people talking badly about you because you care for PLWHA	28 (17.39)	**133 (82.61)**	
Been avoided by friends and family because you care for PLWHA	12 (7.45)	**149(92.55)**	
Been avoided by colleagues because of your work caring for PLWHA	11 (6.88)	**149(93.13)**	

n = number of responses; PMTCT = Prevention of mother-to-child transmission; IQR = interquartile range
*Some respondents left some responses blank; these were not included in the number of responses for the specific question.
** For consistency within the scale, "strongly agree" and "agree" were collapsed into a "yes" category and "strongly disagree" and "disagree" were collapsed into a "no" category; "once or twice," "several times," and "most of the time" were also collapsed into a "yes" category, and "never" were collapsed into a "no" category.

Attitudes towards PLWHA

A small proportion (18-24%) of respondents indicated that they would prefer not to provide services to PLWHA or key populations (Table 3). Similarly, a small proportion of the respondents expressed concern about HIV transmission through drawing blood from (31%) or dressing wounds of (25%) PLWHA. Less than half (40%) of the respondents believed that most PLWHA did not care if they infected other people while very few (26%) believed that most PLWHA had multiple

sexual partners or engaged in irresponsible behaviors (19%). Importantly, 94% agreed that women living with HIV should be allowed to have babies if they wished (Table 3).

When asked about occupational safety, 46% believed HIV/AIDS made their jobs risky. A similar proportion thought it was best to train a few specialists who would be responsible for treating PLWHA, and 32% expressed fear of contracting HIV while on the job. Twenty-two per cent would prefer to refer persons with HIV or AIDS to their professional colleagues, and 19% would rather not have those perceived to be at high risk for HIV/AIDS (e.g., persons who inject drugs or men who have sex with men) as patients. Although 50% of respondents would not eat at restaurant where the chef had HIV or AIDS, 82% admitted that they often had tender, concerned feelings for PLWHA (Table 3).

Table 3: Stigmatizing attitudes and opinions of healthcare workers (n=161)

Variables	Yes n(%)	No n(%)	No opinion n(%)
Opinions about people living with HIV			
Most people living with HIV do not care if they infect other people.	**65(40.37)**	50(31.06)	46(28.57)
People living with HIV should feel ashamed of themselves.	12(7.45)	143(88.82)	6(3.73)
Most people living with HIV have had many sexual partners.	**42(26.09)**	75(46.58)	44(27.33)
People get infected with HIV because they engage in irresponsible behaviors.	**31(19.25)**	108(67.08)	22(13.66)
Women living with HIV should be allowed to have babies if they wish.	**152(94.41)**	8(4.97)	1(0.62)
Fear of contracting HIV infection			
Worried about touching the clothing or bedding of a PLWHA	12(7.45)	144(89.44)	5(3.11)
Worried about dressing the wounds of a PLWHA	**40(24.84)**	110(68.32)	11(6.83)
Worried about drawing blood from a PLWHA	**50(31.06)**	101(62.75)	10(6.21)
Worried about taking the temperature of a patient living with HIV	5(3.11)	148(91.93)	8(4.97)
Willing to care for key populations			
Prefer not to provide services to people who inject illegal drugs.	**36(22.36)**	105(65.22)	20(12.42)
Prefer not to provide services to men who have sex with men.	**39(24.22)**	101(62.73)	21(13.04)
Prefer not to provide services to female sex workers	**30(18.63)**	116(72.05)	15(9.32)
Prefer not to provide services to male sex workers	**32(19.88)**	114(70.81)	15(9.32)
Professional resistance			
HIV/AIDS makes my job as a health worker to be a risky occupation.	**74(45.96)**	83(51.55)	4(2.48)
Afraid of catching HIV because of my job in providing care for PLWHA.	**52(32.30)**	108(67.08)	1(0.62)
Do not want my child to go to a school with a child with HIV/AIDS.	14(8.70)	141(87.58)	6(3.73)
Willing to eat in a restaurant where I know the chef has HIV/AIDS.	70(43.48)	**81(50.31)**	10(6.21)
Fear of becoming infected with HIV if working with HIV/AIDS patients over a long period of time.	15(9.32)	144(89.44)	2(1.24)
Rather work with a better class of people than HIV/AIDS patients.	13(8.07)	139(86.33)	9(5.59)
Prefer to refer PLWHA to my professional colleagues.	**35(21.74)**	121(75.15)	5(3.11)
Prefer not to work with HIV or AIDS patients.	18(11.18)	139(86.33)	4(2.48)
Consider changing my profession specialty/position if it becomes necessary.	6(3.73)	152(94.41)	3(1.86)
Best to train a few specialists who would be responsible for treatment of AIDS patients.	**68(42.24)**	92(57.14)	1(0.62)
Won't treat those at high risk of HIV/AIDS, such as people who inject drugs and men who have sex with men, as patients.	31(19.25)	119(73.91)	11(6.83)
Sometimes find it hard to be sympathetic to patients living with HIV and AIDS.	28(17.39)	125(77.64)	8(4.97)
Resentful if HIV/AIDS patients accounted for a significant part of my caseload.	21(13.13)	116(72.5)	23(14.38)
Often have tender, concerned feelings for people living with HIV or AIDS.	**132(81.99)**	22(13.66)	7(4.35)
Reluctant healthcare workers to work alongside a co-worker living with HIV.	6(3.73)	120(74.53)	35(21.74)

Health facility policies and procedures

As shown in Table 4, most of the health facilities (>75%) had documented policies that aim to protect PLWHA from AIDS-related stigmatization, including policies on HIV counseling and testing. Eighty-six percent of the respondents were aware that they could not test patients for HIV

without their knowledge, and 83% indicated that they would get in trouble at work if they were found to discriminate against a PLWHA. Thirty percent of the respondents noted that they did not have adequate supplies to reduce the risk of becoming infected with HIV.

Table 4: Health facility policies and procedures (n=161)

Variables	Yes	No	No opinion
Policies to HIV management/support			
Policy on HIV testing	**124(77.02)**	20(12.42)	17(10.56)
Test a patient for HIV without their knowledge	21(13.04)	**139(86.34)**	1(0.62)
Get in trouble at work if discriminate against patients living with HIV	**132(82.50)**	15(9.38)	13(8.13)
Written guidelines to protect patients living with HIV from discrimination	**133(82.61)**	18(11.18)	10(6.21)
Infection control guidelines/supplies			
Adequate supplies that reduce risk of becoming infected with HIV	**104(64.60)**	48(29.81)	9(5.59)
Standardized procedures/protocols that reduce risk of becoming infected with HIV	**130(80.75)**	22(13.66)	9(5.59)

Correlation coefficients of the identified variables

As shown in Table 5, opinions about PLWHA were significantly associated with willingness to care for PLWHA ($r = 0.28$, $p < 0.001$), professional resistance ($r = 0.37$, $p < 0.001$), and quality of healthcare policies and procedures ($r = 0.23$, $p < 0.01$). Fear of contracting HIV infection was significantly associated with professional resistance ($r = 0.34$, $p < 0.001$), which was significantly correlated with preference not to care for PLWHA ($r = 0.28$, $p < 0.001$). In terms of socio-demographic variables, age was significantly correlated with opinions of healthcare workers about PLWHA ($r = 0.17$, $p < 0.05$) and healthcare policies and procedures ($r = 0.28$, $p < 0.001$). Providers who received HIV training had less fear of contracting HIV infection ($r = -0.21$, $p < 0.01$) and were less professionally resistant ($r = -0.18$, $p < 0.05$).

Table 5: Correlation Coefficients among Selected Variables

N°	Domains[a]	1	2	3	4	5	6	7	8	9	10
1	Discriminatory behaviors at work	1.00									
2	Opinions about people living with HIV	0.21[b]	1.00								
3	Fear of contracting HIV infection	0.16[c]	0.11	1.00							
4	Willing to care for key populations	0.14	0.28[a]	0.08	1.00						
5	Professional resistance	0.32[a]	0.37[a]	0.34[a]	0.28[a]	1.00					
6	Healthcare policies and procedures	-0.09	0.23[b]	-0.01	0.06	0.04	1.00				
7	Age	-0.08	0.17[c]	0.06	0.11	0.10	0.28[a]	1.00			
8	Gender	0.04	0.09	0.04	-0.06	0.01	0.13	-0.01	1.00		
9	Contact with PLWHA	0.11	0.10	-0.04	-0.05	-0.09	0.08	0.24[b]	0.24[b]	1.00	
10	Training	-0.06	0.04	-0.21[b]	0.13	-0.18[c]	0.24[b]	0.05	-0.06	0.11	1.00

a **Domains**: Different domains were generated from previous tables:
Discriminatory behaviors at work (Table 2) = Extra infection precautions +Observed stigma +Secondary stigma
Opinions about people living with HIV (Table 3) = Most people living with HIV do not care if they infect other people+….+ Women living with HIV should be allowed to have babies if they wish.
Healthcare policies and procedures (Table 4**)** = Policies to HIV management/support + Infection control guidelines/supplies
Training (table 1)=HIV stigma and discrimination + Infection control and universal precautions (including post-exposure prophylaxis)+Patients' informed consent, privacy and confidentiality + stigmatization against key populations.
b $p < 0.001$.
c $p < 0.01$.
d $p < 0.05$.

Multivariate results

Results of multiple regression analyses (Table 6) show that health workers' HIV training and perceived on-the-job infection risk were important predictors of stigmatizing attitudes. Health workers who had received HIV-related training tended to report significantly less stigmatizing attitudes ($\beta = -0.10$), and those who perceived higher infection risk at work were more likely to display higher levels of stigmatizing attitudes ($\beta = 0.84$).

HIV training was the most important predictor of perceived institutional support ($\beta = 0.21$). In addition, older respondents were shown to report stronger institutional support of their work with PLWHA ($\beta = 0.57$). In the final and complete regression model of discrimination at work, opinions and stigmatizing attitudes against PLWHA were the most important factors in predicting

discrimination at work, as the stronger the stigmatizing attitudes, the more frequent or intense the discrimination ($\beta = 0.13$).

Table 6: Estimates results from multivariate regression analysis

Variable	Stigmatizing attitudes	Health facility policies and procedures	Discriminatory behaviors
	n=157	n=157	n=156
Age	**1.52**[b]	**0.57**[a]	**-0.60**[b]
Sex	0.25	0.58	0.002
Profession	-0.02	-0.10	0.0001
Personal contact with PLWHA	-1.33	-0.10	**1.12**[b]
HIV training	**-0.10**[b]	**0.21**[c]	-0.07
Fear of HIV infection	**0.84**[c]		0.03
Attitudes towards PLWHA and key populations			**0.13**[a]
Health facility policies and procedures			-0.16
R^2	0.13	0.17	0.15

[a] $p < 0.001$.
[b] $p < 0.05$.
[c] $p < 0.01$.

DISCUSSION

Although AIDS-related stigmatization poses significant risk to the physical and psychosocial well-being of PLWHA, our current understanding of the extent of the problem among healthcare providers working within primary healthcare centers in Nigeria is based on a few studies (24, 33). The current study of primary health centers in Lagos, Nigeria helps fill this knowledge gap by examining PMTCT service providers' stigmatizing attitudes, perceived risk of infection, and discriminatory behaviors towards patients living with HIV.

Contrary to earlier studies of HIV/AIDS stigmatization in the healthcare setting in Nigeria and elsewhere (24, 33, 34), our study revealed low levels of AIDS-related stigmatization by health workers who provide PMTCT services in Lagos. Overall, we found low levels of secondary

stigmatization and fewer negative attitudes and opinions towards PLWHA. We also found that most health facilities had policies and procedures that dealt with informed consent, confidentiality, and anti-discriminatory practices. Our analysis revealed that HIV training of PMTCT service providers was associated with reduced perception of risk of HIV infection and less stigmatizing attitudes and opinions against PLWHA.

The generally low levels of AIDS-related stigmatization observed among the study participants could be explained by several factors. First, as antiretroviral therapy (ART) becomes more widely available, stigmatizing attitudes may decrease in the population in general and among health workers. Poor access to care has been associated with AIDS-related stigma (35); analysis of Demography and Health Survey (DHS) data from eighteen countries in sub- Saharan Africa found that for every 10-percentage-point increase in proportion of PLWHA on ART, -reported HIV stigmatization decreased 2.3 to 2.8 percentage points (36). Health workers may feel more empowered, less burdened, and less resentful towards PLWHA, when they have the means to provide treatment to them. Earlier studies have shown that lack of available resources and treatment for HIV patients in healthcare settings was associated with an increased sense of despair among health workers, resentment towards HIV patients, and feelings of vulnerability to infection (33, 34, 37). In January 2017, Nigeria adopted the 90-90-90 plan announced by the Joint United Nations Program (UNAIDS) to ensure that: by 2020, 90% of all people living with HIV will know their HIV status; 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy (ART); and 90% of all people receiving ART will have viral suppression. Although there is still huge unmet need for ART in about a third of the states, the number of persons currently on ART has increased from less than 25% in 2014 to 30% in 2017 (38). Second,

the Lagos state government and the US implementing partners, including the Centers for Disease Control and Prevention (CDC), the US Agency for International Development (USAID), and other local and US non-governmental agencies are actively overseeing PMTCT implementation. In fact, during field data collection, we witnessed several PHC centers that were implementing training sessions facilitated by partner agencies. Extensive literature supports the association between HIV/AIDS training and awareness and (1) decreased fear of contagion and (2) reduced AIDS-related stigmatization (34, 39-41). Third, we found that most of the health workers were aware of the HIV/AIDS policies at their centers. Participants noted that they would be disciplined if they were discovered engaging in behaviors that were contrary to policy provisions. HIV anti-discriminatory policies in healthcare settings have been shown to be positively associated with reduced stigmatization and discrimination against PLWHA by health workers (39).

While government oversight and supporting partnerships are encouraging, it should be noted that 30% of the respondents indicated that they did not have adequate supplies to reduce their risk of becoming infected with HIV. The shortage of supplies to support universal safety measures is a common challenge in many healthcare facilities in low- and middle-income countries (42, 43), potentially leading to avoidance of PLWHA (44), and contributing to a preference not to provide services to PLWHA and key populations. During data collection visits, we noted that most of the primary healthcare centers were not supplied with electricity, a perennial problem in Nigeria. Each PHC center received roughly ten thousand naira (30 US$) monthly for gasoline to power standby generators; however, in Nigeria, gasoline is expensive and often in short supply. We observed instances in which health workers contributed money out-of-pocket to purchase gasoline for their standby generators. At night, many facilities also used rechargeable battery-powered emergency

lanterns, including in delivery rooms. Such work conditions could have implications for job dissatisfaction, resulting in discrimination against PLWHA.

Strengths of the study

This study has several notable strengths. First, we used a reliable standardized instrument for assessing AIDS-related stigmatization within the healthcare setting that incorporates relevant constructs and demonstrated discriminant validity (17). Second, this study supports the utility of the USAID instrument in assessing AIDS-related stigmatization in primary healthcare centers and related non-hospital settings in low-income countries. Third, unlike previous studies, our analysis identified factors that mediate AIDS-related stigmatization in the primary healthcare centers, including training and policies. As countries continue to implement task-shifting of services to increase access to antiretroviral treatment, further studies should assess the relationship between AIDS-related stigmatization in primary healthcare centers and uptake of counseling, testing, enrollment into care, and retention.

Limitations

This study has some limitations. First, it was conducted in one state in Nigeria. Thus, the findings are likely to be context-specific and may not be generalizable to other low-income countries. Second, findings from this study were based on self-reported stigmatizing attitudes and discriminatory behavior, and may therefore, be subject to social desirability bias (45). The questions on discriminatory behavior, however, provided an opportunity for respondents to indicate observance of discrimination against PLWHA by other workers, a measure that would presumably be less prone to social desirability bias than evaluation of their own behavior. Still,

the reported discrimination was low. Future studies of stigmatization by healthcare workers would benefit from use of direct observation and patient-reported measures to explore whether providers' perceptions of their attitudes and actions are in alignment with patients' and third-party observers' accounts. Even in the absence of such information, providers' perceptions can be used to inform the development of provider trainings that are responsive to the proficiencies and deficits that providers have identified for themselves.

Results of this study showed that most of the participants were female and nurses. In healthcare facilities in Nigeria, most healthcare workers are nurses, who are usually female. This sample is in accordance with the expected population of healthcare workers in public health facilities in Nigeria. A study conducted by Andrewin and Chien in Belize showed that females and non-religious healthcare workers showed more stigmatizing behavior in attitudes of blame/judgment (20). However, in the present study, we did not demonstrate that gender influenced stigmatization by health workers, and we know of no cultural norms that would suggest otherwise. Nevertheless, future studies to investigate the influence of gender on stigmatizing attitudes and behaviors among healthcare workers may be important. We also did not have enough cadres of other health workers to facilitate an investigation of whether stigmatizing behaviors varied by professional cadre.

CONCLUSIONS

This study provides information that can be cascaded into an overall strategy to reduce AIDS-related stigmatization in the healthcare setting. There is a need to further elucidate issues related to professional resistance and fear of HIV infection among the healthcare workers. Issues related

to health workers values and professional ethics also deserve attention. Since personal attributes predict stigmatizing behavior, the values and beliefs of healthcare workers should be explored and integrated into future AIDS stigma trainings. The finding regarding attitudes towards care provision for key populations also calls for emphasis on professional codes of conduct and ethical provision of care to all deserving clients, irrespective of their status in society or other personal attributes.

Finally, it is important to have documented policies that reduce stigmatization against PLWHA in the healthcare setting. However, such policies should be supported with the provision of basic resources for infection control. This may help to reassure healthcare workers of government's commitment to the health and safety of health workers and may help to address fear of contagion and professional resistance to care for individuals that are perceived to be at high risk for HIV.

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Data sharing statement: Data for this study were collected through a survey of health workers who provided PMTCT services at Primary Health Care Centers in western and eastern districts of Lagos. All relevant summary data are provided in this paper. Interested readers may request data without restriction from the lead author and Fulbright US Scholar to the University of Lagos (2016-2017), Prof. John Ehiri (jehiri@email.arizona.edu).

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page # in Manuscript
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2, 3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3-6
Objectives	3	State specific objectives, including any pre-specified hypotheses	2, 6
Methods			
Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	7, 8
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	9
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	8, 9
Bias	9	Describe any efforts to address potential sources of bias	21
Study size	10	Explain how the study size was arrived at	7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	10
		(*b*) Describe any methods used to examine subgroups and interactions	10
		(*c*) Explain how missing data were addressed	N/A
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(*e*) Describe any sensitivity analyses	N/A

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage	7
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	11
		(b) Indicate number of participants with missing data for each variable of interest	N/A
Outcome data	15*	Report numbers of outcome events or summary measures	12-18
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	12-18
		(*b*) Report category boundaries when continuous variables were categorized	N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	18
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	21
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	22
Generalisability	21	Discuss the generalisability (external validity) of the study results	21
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	23

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.