

Evaluation of Nurses' Knowledge and Attitude toward HIV-Infected Patients in Barbados

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Abstract

Background: Continued assessment of nurses' knowledge and attitude is necessary for improving their performance at workplace. We attempted to evaluate nurses' knowledge and attitude toward HIV-infected patients and their underlying factors. **Methods:** We conducted a descriptive, cross-sectional study participated by 218 nurses and collected relevant data. **Results:** Majority (57.3%) of the nurses had 1 to 5 years of experience in the nursing job, and 78.4% of them were involved in the provision of direct care to HIV-infected individuals for ≤ 5 years, and only 6.4% for ≥ 11 years. The overall knowledge and attitude of the participants were good (3.25/5 and 3.42/5 scores, respectively). The knowledge regarding appropriate care of HIV-infected patients was significantly better among the registered nurses compared to nursing assistants (NA) with limited years of formal education (odds ratio [OR] = 0.37; 95% confidence interval [CI] = 0.20-0.69; $P < .001$). In the provision of care to the HIV-infected patients, the attitude of female participants was significantly better than the males (unadjusted OR = 0.18; 95% CI = 0.05-0.60; $P = .01$). **Conclusion:** Inclusion of relevant HIV- and AIDS-related topics in the curriculum for NAs and closely guided hands-on training of the nurses are likely to improve nurses' knowledge and attitude toward the provision of care to HIV-infected individuals.

Keywords

human immunodeficiency virus (HIV), nurses, knowledge, attitudes, Barbados

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Introduction

HIV and AIDS are a major global health problem and the 10th leading cause of disability-adjusted life years in 2015.^{1,2} In 2017, 36.9 million people were living with HIV and AIDS.³ In 2018, the prevalence of HIV in the Caribbean region was 1.2% among individuals aged between 15 and 49 years.⁴ Between 2005 and 2017 in Barbados, the HIV prevalence among individuals aged 15 to 49 was increased from 0.8% to 1.6%.⁵ During this period, the number of HIV-infected males and females aged 15 to 49 years was increased from 900 to 1800 and from <500 to 860, respectively.⁶ The HIV incidence per 1000 has been reduced from 0.71 to 0.57 during the same period; however, the incidence:prevalence ratio remained 0.06 far higher than the global target of 0.03 set by the United Nations General Assembly.⁶ Male and female sex workers, men who have sex with men, transgender persons, prisoners,

drug users, youth especially who were not school going, and unemployed women were identified as the populations at higher risk of acquiring HIV and AIDS.^{7,8} People living with HIV and AIDS were stigmatized and discriminated, and their families were ashamed.^{7,8} These led them to avert HIV testing and access to life-saving services as well as antiretroviral therapies.⁸

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What Do We Already Know About This Topic?

Within the context of health education and research, there is a gap between the policies and initiatives for their effective implementation.

How Does Your Research Contribute to the Field?

Illustrate the need for making appropriate adjustments to the nurses' course curriculum and continued education at their workplace to improve the quality of patient care.

What Are Your Research's Implications Toward Theory, Practice, or Policy?

Facilitate meaningful modification of the nurses' curriculum and the provision of hands-on training on specialized care at the hospital level.

The nurses providing care to patients with HIV-related illness are required to honor their dignity and confidentiality, and rights and choices.⁹ Like in other places, nurses are the provider of first-line care to the patients living with HIV and AIDS in Barbados⁷; however, they are not much involved in developing HIV-related health policies. This, in the context of health education and research, is considered as an important gap between policy and practice.¹⁰ It is empirical to involve nurses in developing their educational curriculum and developing health policies.¹¹ Improving awareness, communication and sharing of information, and availability of the needed resources are essential in protecting the health-care providers as well as HIV-infected patients.¹⁰ A study among nurses trained on HIV and AIDS noted their limited knowledge and skills.¹² Their judgmental behavior, stigma and consequent discrimination, and noncooperative behavior adversely affected the quality of patient care, which also contributed to depressive symptoms among HIV-infected patients.^{12,13}

The nursing curriculum developed by the Caribbean Community secretariat is based on an epidemiological approach of HIV and AIDS and preventive measures in children, adults, and old age groups including provision of care to HIV-infected pregnant and lactating women.¹⁴ It also includes the ethical aspects and the legal rights of HIV-infected patients, maintaining confidentiality and disclosure issues to prevent stigma, and nurses' attitude toward the provision of care to HIV-infected patients and gender issues.¹⁴ In the nursing curriculum, the topics on HIV and AIDS are the same for both the registered and nursing assistants (NAs) but tailored for NAs for their better comprehension. Within the above-mentioned contexts, we conducted this study to assess the knowledge and attitude of the nurses toward the HIV-infected patients in Barbados.

Conceptual Framework

Figure 1 illustrates the factors influencing nurses' knowledge and attitudes for the caring of HIV-infected patients.

Methodology

Study Design and Setting

This was a hospital-based descriptive, cross-sectional study, and the participating nurses were recruited between January and April 2013. There are 2 major hospitals (Queen Elizabeth Hospital [QEH] and Bayview Hospital), 5 district hospitals, a psychiatric hospital, and 8 polyclinics in Barbados. The study involved nurses working at the QEH, the foremost teaching hospital, and all 5 district hospitals, the psychiatric hospital, and the Ladymeade Reference Unit (LRU) clinic to facilitate representative sampling and minimize selection bias. The QEH, the St Michael Geriatric District Hospital, the Black Rock Psychiatric Hospital, and LRU clinic are located in the parish of St Michael. The other district hospitals, namely the Gordon Cummins District Hospital, the St Lucy District Hospital, the Elayne Scantlebury Hospital, and the St Philip District Hospital are located in St Thomas, St Lucy, St Lucy, and St Philip parishes, respectively. The Gordon Cummins District Hospital is a referral hospital. St Lucy is one of the oldest district hospitals that manages mainly the geriatric patients. The Elayne Scantlebury and St Phillip District Hospitals provide care and treatment to mentally and physically challenged patients. The Black Rock Psychiatric Hospital is the largest of the 3 different psychiatric facilities. Of the 8 polyclinics, the LRU was selected as they primarily provide care and treatment to patients infected with HIV and AIDS.

Study Population

There were 598, 237, 259, and 5 nursing staffs in the QEH, 5 district hospitals, the psychiatric hospital, and LRU, respectively, that is, 1099 in total. Using StatCalc of Epi Info, we estimated the sample size of 276 (25% of the total nurses) to identify the overall expected frequency of knowledge and attitude in caring for HIV-infected patients with 95% confidence interval (CI). We included nurses who were working and had experience with people living with HIV/AIDS. Student nurses and other medical personnel were excluded from this study.

Data Collection

Director of nursing services of all the study hospitals and clinic provided consent for the study and circulated a memorandum to the nurses in their respective hospitals informing them about the research study and its purpose, requesting for their full cooperation and support and their voluntary participation. The hospital directors provided lists of all the nurses who included their name, designation, and department of work. We employed systematic sampling and invited every fifth

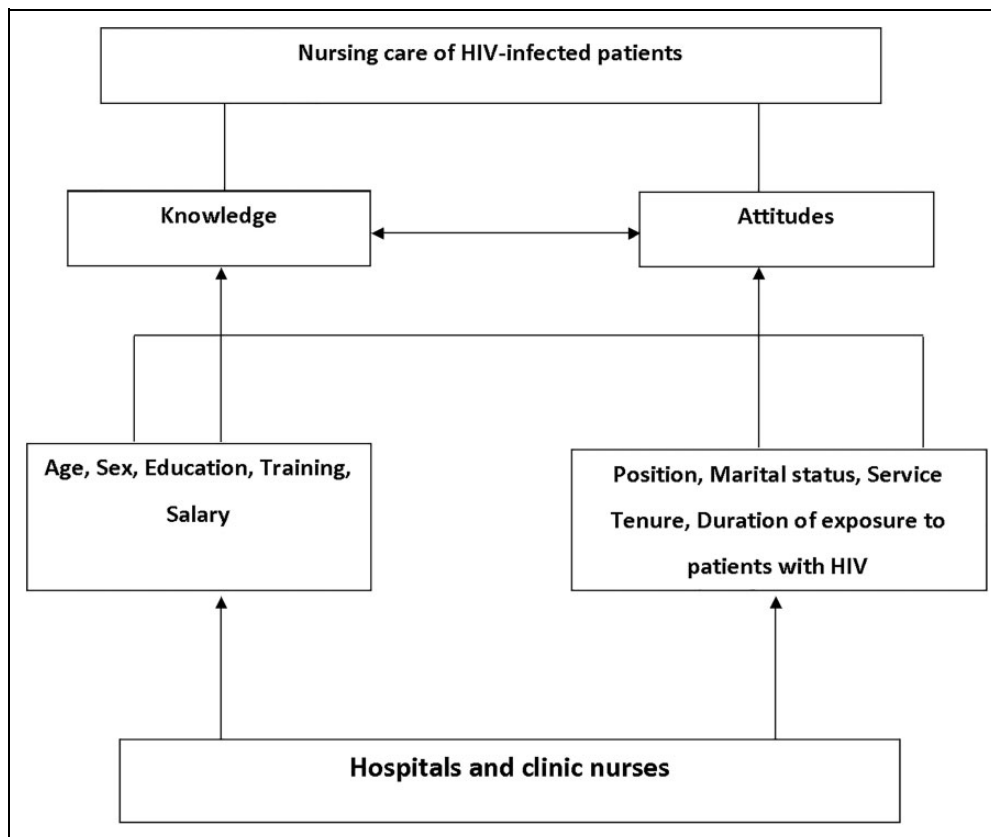


Figure 1. Factors influencing nurses' knowledge and attitudes for the caring of HIV-infected patients.

nurses to take part in the study. Following this, the researchers met with the participants in their respective hospitals and clinic during their work hours, informed them about the purpose and process of the study, the voluntary nature of their participation and maintenance of their confidentiality, and the benefits and risks from participation. Questionnaires were collected from participants directly and also through the nursing in-charge at different times with sealed envelopes after keeping under lock and key to maintain the confidentiality.

We employed a self-administrable questionnaire, based on the studies conducted by Population Council/Horizons Program on "Improving Hospital Environment for HIV and AIDS clients in India" for collection of study data.¹⁵ We pretested the questionnaire on 50 nurses selected by also systemic randomization from the same hospitals and clinic and excluded them from the list to avoid further participation in the main study. The questionnaire was checked for internal consistency and reliability analysis of the items included and modified as appropriate. With regard to nurses' knowledge and attitude toward HIV-infected patients, we considered Cronbach α value of 0.79 and 0.86 (values between 0.6 and 0.9 considered adequate), respectively, as indicative of high internal consistency.

The structured questionnaire had 45 items under 4 sections: demographics, knowledge about the disease, hospital policy, and attitude while providing care to patients living with HIV/

AIDS. Demographic section included the participants' workplace (the study hospitals and clinic) and their age, sex, salary, marital status, education, position, training, and experiences (Table 1). The knowledge-related section included 9-item questions to assess participants' knowledge for maintaining patient's confidentiality, code of nursing ethics, recapping of needles, their rights to know patient's HIV status, patients' consent for HIV testing, etiology and mode of transmission, and universal precautions for caring of patients living with HIV/AIDS. The responses were based on 5-point Likert scale (1 for strongly disagree and 5 for strongly agree), and those with a score below 3.0 (cutoff point 2.9) were considered to have poor and those with scores ≥ 3.0 as having good knowledge (Table 2). The policy section included questions to assess participants' knowledge about their hospital's policy on protecting the safety from exposure to HIV, universal precautions, HIV testing, grievance office to complain on nursing care, management, and prevention of needle stick injury from HIV-infected patients. Their responses to these questions were yes, no, and do not know. The attitude section had also 9 items, with questions such as if they felt that the patients were responsible for being infected, fear for getting infection from the HIV-infected patients, considered treating HIV-infected patients as waste of resources, what type of nursing care they could be expected from the hospitals, using the Likert scale and the same scoring as for knowledge (Table 3).

Table 1. Characteristics of the Participating Nurses.^a

Variables	Description	Frequency	Percent
Hospital	Queen Elizabeth Hospital	111	50.9
	All other study sites	107	49.1
Age, years	19-29	65	30.0
	30-39	77	35.3
	40-49	68	31.1
	≥50	8	3.6
Gender	Male	20	9.2
	Females	198	90.8
Salary/month	US\$<2000	171	78.4
	US\$≥2000	47	21.6
Marital status	Single	143	65.6
	Married	57	26.1
	Divorced/widow/widower	18	8.3
Education	Certificate in nursing	61	28.0
	Bachelor's/master's degree	157	72.0
Nursing position	Registered nurse	180	82.6
	Nursing assistant	38	17.4
Work shifts	Day and evening shift	69	31.6
	Evening and night shift	8	3.7
	All 3 shifts	141	64.7
Duty hours (weekly)	37.5	3	1.4
	40	210	96.3
	>45	5	2.3
Duration of exposure to HIV-infected patients, years	0-5	171	78.4
	6-10	33	15.2
	≥11	14	6.4
Length of nursing job, months	0-11	22	10.0
	12-60	125	57.3
	61-120	33	15.1
	121-180	36	17.0
	181-400	1	0.3
	≥401	1	0.3

^aN = 218.

Statistical Analysis

We entered data and performed analyses using the statistical software package SPSS version 17.0 (SPSS Inc, Chicago, Illinois) and used internal consistency checks, crosstabs, and setting maximum and minimum values for each of the variables to identify correct possible errors. Descriptive statistics, including means, frequencies, and percentages, were calculated for the variables as appropriate. The power (90%) of the tests was calculated for a sample size of 276 respondents from 8 study hospitals and clinic. The odds ratio (OR) and their 95% CI were computed to determine the strength of associations between variables which were run adjusted and unadjusted (CIs and *P* values). Association of the variables was considered significant when their *P* value was ≤.05. Overall, knowledge/attitude was the mean score of the total means. In the logistic regression, knowledge and attitude were used as dependent (outcome) variables, and the age, gender, types of hospitals, salary, marital status, level of education, designation, and HIV-related experience were used as explanatory variables (Tables 4 and 5).

Ethical Approval and Informed Consent

The study was approved by the Joint Ministry of Health of Barbados and the University of the West Indies Research Ethics Committee/institutional review board (approval no. 100111-A), and also from the Board of the QEH. All participants provided written informed consent prior to enrollment in this study.

Results

Participants Characteristics

The questionnaires were administered to 276 participants and completed questionnaire was returned by 218 (79.0%); of whom 198 (90.8%) were females, 180 (82.6%) were registered nurses (RNs), 111 (50.9%) were from the QEH, and 107 (49.1%) from all other hospitals and clinic (5 district hospitals = 60 [27.5%], the psychiatric hospital = 46 [21.1%], and LRU = 1 [0.5%]). The average age of the participants was 35.5 years, 143 (65.6%) were singles, and 171 (78.4%) had a monthly salary of US\$ <2000 (Table 1); 129 (59.2%) graduate and 28 (12.8%) master's degree holding nurses constituted 157 (72.0%) of the total, and the rest 61 (28.0%) had a certificate in nursing. Nearly all (215; 98.6%) of the nurses performed 40 or longer duty hours, and 141 (64.7%) performed all 3 shift duties. The majority (125; 57.3%) had nursing job experience of 1 to 5 years following their education and only 2 (0.6%) had ≥16 years of work experience; however, 171 (78.4%) of the nurses had ≤5 years' experience and 14 (6.4%) had ≥11 years of experience in caring for HIV-infected patients (Table 1).

Participants' Knowledge about HIV and AIDS

The overall average score of knowledge about HIV and AIDS was 3.25. About half of the nurses (117; 53.6%) strongly agreed and others (52; 23.9%) agreed that HIV-infected patients should be treated with respect and their dignity and confidentiality be maintained at all the times. Only 18.8% strongly agreed or agreed (25; 11.5% strongly agreed and 16; 7.3% agreed) that recapping of needles should not be done, and 94.1% did not consider (139; 63.8% strongly disagreed and 66; 30.3% disagreed) universal precautions as an appropriate means to reduce the chances of workplace-related HIV infections—only 3.1% (4; 1.8% strongly agreed and 3; 1.3% agreed) felt it appropriate, while the remaining 6 (2.8%) neither agree nor disagree (Table 2).

Participants' Knowledge Regarding Management of Needle Stick Injuries

Only 39.4% of the participants had the overall knowledge on management of needle stick injury; 102 (46.8%) stated that hands should be thoroughly washed with soap and water following a needle stick, and the majority (116; 53.2%) did not; 57.3% knew that the incident is reportable to the accident and emergency unit of the hospitals/clinic. Most of the nurses (198;

Table 2. Nurses' Knowledge about HIV.^a

Indicators	Strongly Disagree (%)	Disagree (%)	Neither Agree nor Disagree (%)	Agree (%)	Strongly Agree (%)	Mean Score
Treat patients with respect, dignity, and confidentiality	18 (8.2)	30 (13.8)	1 (0.5)	52 (23.9)	117 (53.6)	4.00
Follow International Code of Nursing Ethics	34 (15.6)	63 (29.0)	3 (1.3)	40 (18.3)	78 (35.8)	3.30
Recapping of needles	127 (58.3)	40 (18.3)	10 (4.6)	16 (7.3)	25 (11.5)	4.05
Low risk of infection through mouth-to-mouth resuscitation	35 (16.1)	40 (18.3)	39 (17.9)	68 (31.2)	36 (16.5)	2.86
Nurses' right to know patient's HIV status	9 (4.1)	17 (7.8)	7 (3.2)	57 (26.1)	128 (58.7)	4.27
Need patients' consent for HIV testing	40 (18.3)	81 (37.2)	13 (6.0)	38 (17.4)	46 (21.1)	2.86
Continue nursing job if HIV become positive	29 (13.3)	81 (37.2)	16 (7.3)	74 (33.9)	18 (8.3)	2.87
Use of universal precautions for HIV-related illness	139 (63.8)	66 (30.3)	6 (2.8)	4 (1.8)	3 (1.3)	1.47
Beds of HIV-infected patients should be marked	74 (33.9)	54 (24.8)	20 (9.2)	61 (28.0)	9 (4.1)	3.56

^aN = 218.**Table 3.** Nurses' Attitudes toward HIV-Infected Patients.

Indicators	Strongly Disagree (%)	Disagree (%)	Neither Agree nor Disagree (%)	Agree (%)	Strongly Agree (%)	Mean Score
Patients are responsible for their HIV infections	58 (26.6)	32 (14.7)	16 (7.3)	67 (30.7)	45 (20.6)	2.96
HIV-infected patients should be admitted during illness	44 (20.2)	78 (35.8)	20 (9.2)	54 (24.8)	22 (10.0)	2.69
Avoiding tendency for caring of HIV-infected admitted patients	60 (27.5)	77 (35.3)	42 (19.2)	33 (15.1)	6 (2.8)	3.70
HIV-infected patients should be isolated from other patients	66 (30.2)	51 (23.3)	47 (21.6)	46 (21.1)	8 (3.7)	3.55
Feeling comfortable in caring HIV-infected patients	58 (26.6)	32 (14.7)	16 (7.3)	67 (30.7)	45 (20.6)	3.04
Treating HIV-infected patients considered as waste of resources	103 (47.2)	92 (42.2)	12 (5.5)	73 (1.4)	8 (3.7)	4.28
Concerned becoming infected through patient care	44 (20.2)	78 (35.8)	20 (9.2)	54 (24.8)	22 (10.0)	3.31
Level of nursing care of HIV-infected patients should be different	72 (33.0)	54 (24.8)	57 (26.1)	19 (8.7)	16 (7.3)	3.67
Transmit HIV infection to family members for carrying of HIV-positive patients	82 (37.6)	39 (17.9)	31 (14.2)	54 (24.8)	12 (5.5)	3.57

^aN = 218.

90.8%) were not aware of the need for tetanus toxoid and wound dressing (185; 84.9%) following needle stick, while 151 (69.3%) preferred cleaning of the needle stick injury using alcohol.

Participants' Knowledge Concerning Hospital Policy on HIV and AIDS

Overall, 26.0% of the participants were unaware of hospital policy on HIV/AIDS, and 120 (55.0%) were aware of hospital policy on workers' safety on exposure to pathogens. Despite having universal precaution policy, 168 (77.1%) were unaware of its existence. One hundred sixty-two (74.3%) participants were aware of the hospital/clinic policy on confidentiality of individuals with HIV. Ninety-six (44.0%) participants reported to have sustained a needle stick injury with a contaminated needle or splashing of blood from HIV-infected patients on their bare skin; however, 152 (69.7%) were aware of the hospital/clinic procedures for HIV testing and 109 (50.0%) of the nurses were aware of access to HIV-related medication in their respective hospitals. With regard to hospital policies on patients' rights and access to medical services, 82 (37.6%) responded that patients did not have equal access compared to any other diseases, 161 (73.9%) reported delayed initiation of treatment, 157 (72.0%) felt there was no mandatory testing,

and 110 (50.5%) felt that they could refuse caring for HIV-infected patients.

Participants' Attitudes toward HIV-Infected Patients

The overall average score of the participants' attitudes toward HIV-infected patients was 3.42. One hundred twelve (51.3%) participants (45; 20.6% strongly agreed and 67; 30.7% agreed) felt that HIV-infected patients were responsible for their own illness consequent to their risk behavior. Fifty-four (24.8%) participants strongly agreed and agreed that the HIV-infected patients should be managed in wards separately from other patients such as those with hepatitis B or other infections. A small proportion (11; 5.1%) of the participants strongly or otherwise felt that treating HIV-infected patients was waste of resources, and 66 (30.3%) strongly or otherwise felt that despite not being infected they could carry HIV to their home (Table 3).

Factors Associated with Participants' Knowledge of Care for Patients with HIV and AIDS

In the binary logistic regression model, the independent variable such as the level of education was significantly associated ($P < .001$) with the knowledge on HIV and AIDS among the

Table 4. Factors Associated with Nurses' Knowledge in Providing Care to the HIV-Infected Patients.

Factor	Unadjusted			Adjusted		
	OR	95% CI	P	OR	95% CI	P
Age, years						
20-29	Ref					
30-39	1.21	0.74-1.97	.45	0.85	0.35-2.04	.71
40-49	1.31	0.83-2.08	.25	0.95	0.43-2.07	.89
>50	1.09	0.62-1.92	.77	0.82	0.37-1.81	.62
Gender						
Male	Ref					
Female	1.86	0.74-4.66	.19	1.91	0.70-5.22	.21
Hospital						
Queen Elizabeth	Ref					
Other hospitals	1.06	0.72-1.54	.77	-	-	-
Salary/month						
US\$<2000	Ref					
US\$≥2000	1.28	0.95-1.73	.11	1.72	0.82-3.61	.16
Marital status						
Single	Ref					
Married	1.2	0.68	1.67	0.28	-	-
Education						
Degree	Ref					
Certificate	0.65	0.39-1.08	.09	0.37	0.20-0.69	<.001 ^a
Designation						
Registered nurse	Ref					
Nursing assistant	0.9	0.48-1.70	.75	-	-	-
HIV-related experience						
0-5 years	Ref					
>5 years	1.25	0.93-1.69	.15	1.12	0.58-2.16	.74

Abbreviations: CI, confidence interval; OR, odds ratio.

^aSignificant at the .05 level.

participants. None of the other variables were significantly associated with their knowledge (Table 4).

Factors Associated with Participants' Attitudes in Caring for HIV-Infected Patients

We performed binary logistic regression to determine the association between some predetermined factors on participants' attitudes. After adjusting for possible confounders, the participants in the 5 district hospitals, psychiatric hospital, and LRU were significantly less likely to have good attitudes regarding caring of patients with HIV and AIDS compared to the nurses working at the QEH. It appeared that the female nurses were more likely to have positive attitudes toward HIV-infected patients than the males; however, after adjusting for confounding, nurses' sex did not remain significant. There was no significant association between participants' age, marital status, level of education, salary, and duration of experience with their attitudes for caring for HIV-infected patients (Table 5).

Discussion

The purpose of our study was to assess the knowledge and attitudes of the nurses involved in the provision of care for

Table 5. Factors Associated with Nurses' Attitudes toward Caring for HIV-Infected Patients.

Factor	Unadjusted			Adjusted		
	OR	95% CI	P	OR	95% CI	P
Age, years						
20-29	Ref					
30-39	0.84	0.31-2.27	.73	-	-	-
40-49	0.64	0.24-1.74	.38	-	-	-
>50	0.79	0.27-2.28	.66	-	-	-
Gender						
Male	Ref					
Female	0.18	0.05-0.60	.01 ^a	0.41	0.11-1.54	.19
Hospital						
Queen Elizabeth	Ref					
Other hospitals	0.56	0.29-1.10	.09	0.38	0.21-0.12	.001 ^a
Salary/month						
US\$<2000	Ref					
US\$≥2000	1.13	0.50	.78	-	-	-
Marital status						
Single	Ref					
Married	1.38	0.67-2.81	.38	-	-	-
Education						
Certificate	Ref					
Degree/master's	1.57	0.78-3.16	.19	0.87	0.45-1.69	.69
Designation						
Registered nurse	Ref					
Nursing assistant	1.03	0.44-2.44	.95	-	-	-
HIV-related experience						
0-5 years	Ref					
>5 years	1.35	0.58-3.13	.49	-	-	-

Abbreviations: CI, confidence interval; OR, odds ratio.

^aSignificant at the .05 level.

HIV-infected patients in Barbados, a place where the prevalence of HIV and AIDS was high (1.6%) in 2017.⁵ Most of the nurses were females, as has also been reported earlier.^{16,17} The salaries of around three-fourths of the participants were not adequate.¹⁸ Inadequate compensation and lack of job satisfaction were considered among factors that may be related to their negative attitude toward the provision of care for patients living with HIV/AIDS, and our findings are in agreement with this consideration.¹⁹

We noted that compared to the RNs, the NAs lacked adequate knowledge regarding the provision of optimal care to HIV-infected patients. This was expected since NAs study for only 1 year compared to RNs who study for 4 year ($P < .001$).²⁰ In Barbados, the NAs work under the guidance of RNs.²⁰ Our findings are similar to another study that observed fourth-year nursing students and faculty members of a nursing school possess the highest knowledge and attitude about HIV and AIDS compared to the first and third year students.²¹ Other studies have observed a proportionate increase in the knowledge with an expansion in the length of formal education.²²⁻²⁴

A masters' degree was the highest qualification among our study nurses (12.8%), and they, along with graduate nurses, constituted 72.0% of our participants; 17.4% were NAs.

A study emphasized the usefulness of HIV-related education in improving nurses' knowledge and attitude²⁵ and further education for nurses lacking such knowledge.²⁶ Effective knowledge and supervised contact with HIV-infected patients are likely to significantly reduce the stigmatized attitudes compared to only a knowledge-based program.²⁷

Only 44.0% of the respondents had the information to seek prophylactic care after needle sticks. Although the vast majority of the nurses expressed that recapping of needles was neither appropriate nor acceptable, nearly a fifth (18.8%) did not agree. Other studies have observed that inadequate knowledge on occupational safety was responsible for the recapping by 30.0% and not reporting needle sticks by 7.8%.^{17,28} Alarming, 94% of our study nurses felt (63.8% strongly and 30.3% otherwise) against the usefulness of universal precautions in caring for HIV-infected patients (Table 2). Interestingly, 19.7% of our study participants were not even aware about the hospital policy on universal precautions for reducing workplace-related HIV and AIDS infections. In contrast, one study found 98.0% of the participants to be aware of hospital protocol of postexposure prophylaxis (PEP).²⁹

It was good to note that the majority (53.6%) of our study participants felt that HIV-infected patients deserved proper respect and their dignity maintained in regard to the confidentiality of their status. Only a third (35.8%) of our study participants stated that the International Code of Nursing served as a guide for nursing care with HIV-infected patients. A study in Nigeria reported the level of knowledge to be significantly related ($P = .000$) to nurses' attitudes.³⁰

About a quarter (24.8%) of the nurses felt that HIV-infected patients should be treated in separate wards and not kept with other patients in the same ward. They were also worried about the possibility of being infected while providing care to the HIV-infected patients, indicating their lack of knowledge about HIV transmission, which is in agreement with another study and indicates that the nurses' attitude was related to their perceived risk of occupational infection.^{21,31} We did not observe any significant association between participants' age and their knowledge and attitudes, which was similar to a study carried out in South Africa.³² However, one study in Italy found a positive association between age and that knowledge ($P = .000$),²⁴ and another study reported negative association.²³ There is a general perception that older nurses with greater experience would have more caring attitudes toward patients living with HIV/AIDS,²¹ which we did not observe in our study.

About a third (30.3%) of our respondents possessed a negative attitude regarding the risk of getting infected while providing care to the patients living with HIV/AIDS. An earlier university community study observed a general lack of understanding about personal risks, despite knowing the modes of transmission and the means to prevent HIV and AIDS, which was associated with unsafe sex and sex with multiple partners, also reflecting their attitudes toward HIV and AIDS.³³ It is important to encourage nurses to gather knowledge through their educational curriculum and on-the-job training to

overcome the stigma attached to HIV and AIDS and to demonstrate positive attitudes toward people living with HIV and AIDS.³⁴

About half (51.3%) of our study participants felt that homosexual behavior was the reason for their patients being infected with HIV, and thus, they did not have a good attitude toward these patients; our finding is similar to an earlier study.³⁴ Some of the nurses felt that providing treatment to HIV-infected patients was a waste of resources. Our findings indicate an urgent need for addressing these negative attitudes that is related to their knowledge and understanding in order to improve their confidence in providing care to HIV-infected individuals without any fear.³⁵

The QEH is a teaching hospital in Barbados, and we expected the participants to be conversant with their job-related hospital policies including procedures to be followed in the management and treatment of HIV-infected patients; however, we found a significant proportion of our respondents were not aware of them. An earlier study also noted that 22% of the participants were neither aware nor even certain about the availability of PEP.¹⁶ The finding suggests the need for improving the induction and orientation to their job to ensure that the nurses are conversant about workplace/job-related policies, with an emphasis on occupational safety and prophylactic measures. Availability of PEP and its effective communication is important to improve workers knowledge of PEP.¹⁶ In terms of gender, female nurses had more positive attitudes toward the patients than the males, and our findings are similar to a previous study.³¹

We observed a good overall knowledge and attitude among the participants, as was observed elsewhere.^{30,31} The QEH nurses had significantly better knowledge and attitudes compared to the nurses at other hospitals/clinics involved in the study. This was expected since QEH is a teaching hospital, and thus, the nurses are exposed to more current information and practices. The length of work experiences positively correlated with knowledge and attitude. Knowledge and attitude are influenced by the education, training, and hands-on experience in dealing with HIV-infected patients.³⁶ The Canadian Association of Nurses in AIDS Care integrated HIV- and AIDS-related basic information on transmission, prevention, testing, diagnosis, treatment, counseling, and care-based management in their nursing curriculum.³⁷

Strength and Limitations of the Study

The limitations of this study include our method of collecting data by way of nurses self-reported answers to our questionnaires, which might have been associated with a response bias. There might also have been some elements of social desirability bias in making their response, especially on a sensitive topic such as HIV and AIDS. On the other hand, the study was conducted among the nurses from different hospitals and HIV and AIDS treatment facilities throughout the country, and thus, the findings are likely to reflect true representation of nurses in the entire country.

Conclusions

In this study, we made efforts to understand the current knowledge and attitude of Barbadian nurses in the provision of direct care to HIV-infected patients and to understand the factors that shape their attitudes. Our study findings support the need to improve nurses' overall knowledge on HIV, especially its cause and mode of transmission, workplace safety particularly universal precaution, and postexposure policies and processes, to improve their attitude. Registered nurses with 4 years of education were more knowledgeable than the NAs with 1 year of certificate course. Addition of HIV-related topics in the curriculum and establishment of effective continued professional development courses, guided training by seniors at the workplace, could improve their confidence and thus improve their attitude on HIV and AIDS. Effective institutional systems must also be put in place to inform nurses on job-related policies, mode of transmission of the disease, precaution, and prophylactic management to change and improve their attitude in discharging their assigned responsibilities. It is also possible to improve knowledge and skills of the nurses, especially NAs, impacting positively on the attitude through on-the-job, practical oriented training, before placing them in specialized units, such as HIV and AIDS wards. Evaluation of the current nursing curriculum and the addition of topics to improve the knowledge and supervised on-the-job training could further help improve nursing care including the provision of nursing care to people with HIV and AIDS. Further research to identify knowledge gaps and assessing practical means to improve attitude would be beneficial to nurses and educators alike.

Authors' Note

K.A.T.M.E.H. and E.E.H. contributed to study design and data collection and analysis. K.A.T.M.E.H., M.M., H.S., M.M.R. involved in manuscript preparation and revision.

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References

- World Health Organization. Facts in pictures on HIV/AIDS. 2018. <https://www.who.int/news-room/facts-in-pictures/detail/hiv-aids>. Accessed May 21, 2019.
- GBD 2015 DALYs & HALE Collaborators. Global, regional, and national disability-adjusted life-years (DALYs) for 315 diseases and injuries and healthy life expectancy (HALE), 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*. 2016;388(10053):1603–1658. doi:10.1016/S0140-6736(16)31460-X.
- World Health Organization. Data and statistics. 2018. <https://www.who.int/hiv/data/en/>. Accessed May 21, 2019.
- Joint United Nations Programme on HIV/AIDS. Latin America and the Caribbean. AIDSinfo. Regional, Caribbean. 2019. <https://aidsinfo.unaids.org/>. Accessed August 15, 2019.
- Joint United Nations Programme on HIV/AIDS (UNAIDS). UNAIDS 2018 estimates. 2019. <http://aidsinfo.unaids.org/>. Accessed May 18, 2019.
- Joint United Nations Programme on HIV/AIDS (UNAIDS). UNAIDS DATA 2018. UNAIDS/JC2929E. 2018. www.unaids.org/sites/default/files/media_asset/unaids-data-2018_en.pdf. Accessed May 21, 2019.
- The World Bank. Project & operations. Barbados Second HIV/AIDS Project, ICR3323. 2015. <http://documents.worldbank.org/curated/en/737601468190745766/pdf/ICR3323-P106623-Box391466B-PUBLIC-disclosed-6-15-15.pdf>. Accessed May 21, 2019.
- United States Agency for International Development. Latin America and the Caribbean, eastern and southern Caribbean, HIV/AIDS. 2017. <https://www.usaid.gov/barbados/hiv/aids>. Accessed May 24, 2019.
- International Council of Nurses. *The ICN Code of Ethics for Nurses*, Geneva. 2012. http://www.icn.ch/images/stories/documents/about/icncode_english.pdf. Accessed May 28, 2019.
- Richter MS, Mill J, Muller CE, et al. Nurses' engagement in AIDS policy development. *Int Nurs Rev*. 2013;60(1):52–58. doi:10.1111/j.1466-7657.2012.01010.x.
- Shariff NJ. Empowerment model for nurse leaders' participation in health policy development: an east African perspective. *BMC Nurs*. 2015;14:31. doi:10.1186/s12912-015-0078-6.
- Manganye BS, Maluleke TX, Lebeso RT. Professional nurses' views regarding stigma and discrimination in the care of HIV and AIDS patients in rural hospitals of the Limpopo province, South Africa. *Afr J AIDS Res*. 2013;12 (1):33–40. doi:10.2989/16085906.2013.815411.
- Maia Â, Gomes H, Gonçalves M. Relationship between HIV and depressive symptomatology in patients from northern Portugal: analysis of individual, health, and social predictors. *J Assoc Nurses AIDS Care*. 2018;29(2):275–286. doi:10.1016/j.jana.2017.09.006.
- Caribbean Community (CARICOM) Secretariat, Guyana. Curriculum for registered nursing education programme, B.Sc. Nursing. 2011. https://caricom.org/documents/12064-curriculum_for_registered_nursing_education_programme.pdf. Accessed May 30, 2019.
- Jointly developed for the study "Improving the hospital environment for HIV-positive clients in India" by Horizons/Population Council (New Delhi & Washington, DC). Society for Service to Urban Poverty (New Delhi). The PLHA-Friendly Achievement Checklist. A Self-assessment tool for hospitals and other medical

- institutions caring for people living with HIV/AIDS (PLHA). 2003. <http://www.popcouncil.org/uploads/pdfs/horizons/pfechk1st.pdf>. Accessed May 29, 2019.
16. Makhado L, Davhana-Maselesle M. Knowledge and uptake of occupational post-exposure prophylaxis amongst nurses caring for people living with HIV. *Curationis*. 2016;39(1): a1593. doi:10.4102/curationis.v39i1.1593.
 17. Aluko OO, Adebayo AE, Adebisi TF, et al. Knowledge, attitudes and perceptions of occupational hazards and safety practices in Nigerian healthcare workers. *BMC Res Notes*. 2016;9: 71. doi:10.1186/s13104-016-1880-2.
 18. Salary explorer. Average salary survey in Barbados. Salary comparison by job category. 2018. <http://www.salaryexplorer.com/salary-survey.php?&loctype=1&loc=19>. Accessed May 27, 2019.
 19. Nyirenda M, Mukwato P. Job satisfaction and attitudes towards nursing care among nurses working at Mzuzu Central Hospital in Mzuzu, Malawi. *Malawi Med J*. 2016;28(4): 159–166. doi:10.4314/mmj.v28i4.3.
 20. The Barbados Community College. 2018. <http://www.bcc.edu.bb/Divisions/HealthSciences/ProgrammesOfStudy.aspx>. Accessed May 19, 2019.
 21. Juan MLM, Roser TR, Maria FC, et al. Attitudes to HIV and AIDS among students and faculty in a school of nursing in Barcelona (Spain): a cross-sectional survey. *Collegian*. 2017;24(6): 593–601. doi:10.1016/j.colegn.2016.10.006.
 22. Ngaihte PC, Santella AJ, Ngaihte E, et al. Knowledge of human immunodeficiency virus, attitudes, and willingness to conduct human immunodeficiency virus testing among Indian dentists. *Indian J Dent Res*. 2016;27(1):4–11. doi:10.4103/0970-9290.179806.
 23. Aghamolaei T, Tavafian SS, Hasani L, Zare S. Attitudes of healthcare providers towards patients with HIV/AIDS in Bandar Abbas. *Arch Iran Med*. 2009;12(3):298–301.
 24. Marina M, Rosalia R, Marco P, Giuseppina F, Maria AC. Knowledge, attitudes and practices towards patients with HIV/AIDS in staff nurses in one university hospital in Sicily. *Epidemiol Biostat Public Health*. 2013;10(1):e8731. doi:10.2427/8731.
 25. Geethika NN, Eun-Ok C. Effectiveness of AIDS education program on nursing students' AIDS knowledge and AIDS attitudes in Sri Lanka. *J Nurs Educ Pract*. 2018;8(6):1–9. doi:10.5430/jnep.v8n6p1.
 26. Williams AB, Le ST, Colby D, et al. Effectiveness of train-the-trainer HIV education: a model from Vietnam. *J Assoc Nurses AIDS Care*. 2014;25(4):341–350. doi:10.1016/j.jana.2013.07.005.
 27. Yiu JW, Mak WWS, Ho WS, Chui YY. Effectiveness of a knowledge-contact program in improving nursing students' attitudes and emotional competence in serving people living with HIV/AIDS. *Soc Sci Med*. 2010;71(1):38–44. doi:10.1016/j.socscimed.2010.02.045.
 28. Jahangiri M, Rostamabadi A, Hoboubi N, Tadayon N, Soleimani A. Needle stick injuries and their related safety measures among nurses in a university hospital, Shiraz, Iran. *Saf Health Work*. 2016;7(1):72–77. doi:10.1016/j.shaw.2015.07.006.
 29. Puja SD, Sarojini S, Pratik P, Pankaj RD. Knowledge regarding postexposure prophylaxis of HIV among nurses. *Nurs Res Rev*. 2017;7:45–50. doi:10.2147/NRR.S131454.
 30. Okpala PU, Uwak R, Nwaneri AC, et al. Nurses' knowledge and attitude to the care of HIV/AIDS patients in South East, Nigeria. *Int J Community Med Public Health*. 2017;4:547–553. doi:10.18203/2394-6040.ijcmph20170289.
 31. Ouzouni C, Nakakis K. HIV / AIDS knowledge, attitudes and behaviours of student nurses. *Health Sci J*. 2012;6(1):129–150. <http://www.hsj.gr/medicine/hiv-aids-knowledge-attitudes-and-behaviours-of-student-nurses.pdf>. Accessed May 19, 2019.
 32. Delobelle P, Rawlinson JL, Ntuli S, et al. HIV/AIDS knowledge, attitudes, practices and perceptions of rural nurses in South Africa. *J Adv Nurs*. 2009;65(5):1061–1073. doi:10.1111/j.1365-2648.2009.04973.x.
 33. Petros P. Risk perception, HIV/AIDS related knowledge, attitude and practice of the university community: the case of Ethiopian Civil Service College. *HIV AIDS Rev*. 2014;13(1): 26–32. doi:10.1016/j.hivar.2013.12.001.
 34. Rutledge SE, Abell N, Padmore J, McCann TJ. AIDS stigma in health services in the eastern Caribbean. *Soc Health Illn*. 2009; 31(1):17–34. doi:10.1111/j.1467-9566.2008.01133.x.
 35. Hunte EI. The unsung nightingales: the development of nursing in Barbados from 1844 to the year 2000. 2009. <http://www.chattelhousebooks.net/the-unsung-nightingales>. Accessed June 03, 2019.
 36. Suominen T, Koponen N, Mockiene V, et al. Nurses' knowledge and attitudes to HIV/AIDS—an international comparison between Finland, Estonia and Lithuania. *Int J Nurs Pract*. 2010; 16(2):138–147. doi:10.1111/j.1440-172X.2010.01822.x.
 37. Canadian Association of Nurses in AIDS Care (CANAC). Core Competencies for HIV/AIDS Nursing Education at the Undergraduate Level. 2013. http://canac.org/wp-content/uploads/2015/11/CANAC_core_comp_e.pdf. Accessed June 04, 2019.