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Nurses knowledge, attitudes and practices towards patients with HIV and AIDS in Kumasi, Ghana

Dorothy Serwaa Boakye[a,b,*,1], Azwihangwisi Helen Mavhandu-Mudzusi[c,2]

[a] Department of Health Studies, University of South Africa, South Africa
[b] Kwame Nkrumah University of Science and Technology (KNUST) Hospital, Kumasi, Ghana
[c] Department of Health Studies, University of South Africa, South Africa

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ABSTRACT

Background: Studies on knowledge, attitudes and practices among health care workers involved in HIV and AIDS care have often revealed the lack of knowledge about HIV and AIDS. Nurses' knowledge may compromise the quality of care and attitudes towards patients living with HIV/AIDS. Special nursing knowledge and skills have been suggested as prerequisite for taking care of patients with HIV.

Purpose: The purpose of this study is to assess nurses' knowledge, attitudes and practices towards patients with HIV and AIDS in Kumasi, Ghana.

Methods: A quantitative cross-sectional study was conducted among 247 nurses at five selected health facilities in the Kumasi Metropolis. Data was collected by means of structured self-administered questionnaire and analysed using SPSS version 23.0. Results were presented using charts and tables.

Results: Knowledge on HIV and AIDS was satisfactory but some still hold erroneous beliefs and misconception about HIV transmission. A majority demonstrated favourable attitudes. Nurses had fears of contracting the virus, which resulted in the display of negative attitudes by some. Their practice of universal precautions was satisfactory; however there was evidence of non-compliance among some of them.

Conclusion: The need for continuous in-service training of nurses on HIV and AIDS is a key contributing factor to promoting knowledge, correcting a misconception, favourable attitude and improve compliance to universal precautions and other preventive practices such as uptake of PEP.

1. Introduction

According to the Joint United Nations Program on HIV/AIDS, since the beginning of the HIV epidemic, approximately 78 million people have been infected with HIV, with an approximate 35 million people dying due to AIDS-related illnesses and an estimated 36.7 million people living with HIV worldwide by the end of 2015 (UNAIDS, 2018). In 2017 the number of people newly infected with HIV and the number of people who died from AIDS-related illnesses was approximately 2.1 million and 1.1 million, respectively (Foundation for AIDS Research, 2018).

Sub-Saharan Africa bears the greatest burden, as it sees more than two thirds (69%) of all persons infected with HIV. An estimated 25.8 million people were living with HIV and AIDS in Sub-Saharan Africa, whereby at the end of 2014, women accounted for more than 50% of the number, 2.3 million of which were girls. Estimated new infections in Sub-Saharan African were 1.4 million, which represents 70% of new infections worldwide. AIDS-related deaths account for 790,000 people in Sub-Saharan Africa (Sentinel Survey Report, 2015).

In Ghana, the prevalence rate of HIV is estimated to be 1.47% among ages 15–49 years (UNAIDS, 2014). An estimated 250 000 of the population living with HIV and 10 000 deaths per annum makes it a public health problem in Ghana (UNAIDS, 2014; Ghana AIDS Commission, 2014). The evolution of HIV infection into a chronic disease implicates that people with the condition will require ongoing medical attention, antiretroviral treatment, and support from health

Abbreviations: AIDS, acquired immunodeficiency syndrome; ARV, antiretroviral; CDC, center for disease control and prevention; KAP, knowledge, attitude and practice; KATH, Komfo Anokye teaching hospital; KNUST, Kwame Nkrumah University of science and technology; HIV, human immunodeficiency virus; PLWHA, people living with HIV and AIDS; PEP, post-exposure prophylaxis; UNAIDS, the joint United Nations programme on HIV/AIDS; WHO, world health organization

* Corresponding author at: Kwame Nkrumah University of Science and Technology Hospital, PMB, Kumasi, Ghana.
E-mail addresses: dorothyboakye@yahoo.co.uk (D.S. Boakye), mmudza@unisa.ac.za (A.H. Mavhandu-Mudzusi).
[1] Postal address: KNUST Hospital, PMB, Kumasi, Ghana.
[2] Postal address: Department of Health Studies, University of South Africa, City of Tswane, South Africa.

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workers. Hospitals in Ghana are still struggling to deal with challenges such as uneven doctor to patient ratio in the health systems. This has led to the World Health Organization (WHO) recommending tasks shifting from doctors to nurses, midwives, and other paramedic staffs in the management of HIV and AIDS in 2008 (Suzan-Monti et al., 2015:308). The uptake of HIV/AIDS services by nurses has shown significant results. According to Iwu and Holzemer (2014:50), task shifting to nurses has led to increased access to ART, retention in care and improved outcomes in PLWHA. That notwithstanding, task shifting has contributed to increased workload and burn-out in nurses (Makhado & Davhana-Maselesele, 2015:6).

The nursing of HIV-positive and AIDS patients requires special skills and attitudes. However, a number of studies have suggested health workers including nurses hold negative attitudes towards people living with HIV and AIDS (Manganye, Maluleke, & Lebese, 2013:36; Ishimaru et al., 2017:4; Wada, Smith, & Ishimaru, 2016:4). Such negative attitudes come in the form of discrimination and stigma. Stigma and discrimination undermine all efforts to reach out to people with HIV information, HIV testing, treatment, and HIV preventive modalities to reduce their risk of infection.

Amidst these negative attitudes, the nurses' knowledge level of HIV and AIDS may have an impact on the quality of services provided (Gagnon & Cator, 2015:414). The inadequate knowledge of HIV and AIDS or lack thereof, are conditions associated with nurses's demonstration of fear, stigmatisation, and unwillingness to care for PLWHA (Farotimi, Nwozichi, & Ojediran, 2015:709; Iwoi et al., 2017:10; Som, Bhattacherjee, Guha, Basu, & Datta, 2015:52), good knowledge on HIV/AIDS was an important step to reducing the fears, anxiety and negative attitudes exhibited by nurses (Suominen et al., 2015:5; Marranzano, Ragusa, Platania, Faro, & Coniglio, 2013:4). Farotimi et al. (2015:709) observed that poor knowledge of HIV and AIDS was a predictor of stigmatisation towards PLWHA. A study by Iwoi et al. (2017:5) also noted that the lack of HIV related knowledge was linked to the demonstration of fear, stigmatisation, and unwillingness to care for PLWHA. Lack of knowledge and misconceptions surrounding the spread of HIV has been identified by several researchers (Som et al., 2015:18) as the number one reason determining nurses' discriminatory attitudes towards PLWHA. In view of this, studies have suggested the need for the inclusion of the basic aspects of HIV in the curricular of nurses' training institutions (Farotimi et al., 2015: 709). In Vienna, Lao PDR, less than 50% of the nurses and medical doctors had received formal training on HIV and AIDS-related issues (Vorasane et al., 2017:10). Additionally, the availability of resources and compliance with the standard precautions was a positive element contributing to a positive attitude in nurses, such as willingness to care. Adherence to infection control measures not only serves to protect nurses but also help them to render quality care (Ishimaru et al., 2017:5).

In Ghana, although some studies were conducted on extant knowledge, attitudes, and practices towards people living with HIV, those who show any interest in the status of nurses in this regard are hard to come by. However, information about Ghanaian registered nurses' knowledge, attitudes and practices (KAP) regarding HIV is needed to devise an appropriate educational program for nurses to alleviate nurses' anxiety about caring for patients who are HIV positive and also alleviate the fear in their communities.

2. Study hypothesis

It is hypothesized that;

1. Nurses HIV/AIDS related knowledge is not influenced by the number of seminars on HIV/AIDS attended and increased years of work experience.
2. Nurses with increased knowledge on HIV/AIDS will have positive attitudes towards people living with HIV and AIDS.
3. Nurses with increased knowledge on HIV/AIDS and favourable attitudes will exhibit good practices towards people living with HIV and AIDS.

3. Materials and methods

3.1. Study design and setting

This study primarily applied a quantitative research approach with a touch of descriptive cross-sectional study to describe and provide information about the knowledge, attitudes, and practices of nurses caring for HIV-infected patients in health care facilities, without attempting to manipulate or control the participants.

This study was conducted in two private health facilities (Clinic [Facility A] and Medical Centre [facility B]), two public health facilities (University Hospital [facility C] and District Hospital [facility D]), and a Teaching Hospital (KATH [facility E]) in the Kumasi metropolis. The two private health facilities selected have the longest history of HIV/AIDS management services in the metropolis and have been providing these services since 2006. The two government health facilities were amongst the first health care facilities selected in the metropolis for HIV/AIDS management and had provided services to the public since 2003 and administered Anti-Retroviral treatment to HIV/AIDS patients. The teaching hospital has been at the forefront of HIV/AIDS management since its discovery in Ghana and was the first to introduce ARV treatment in the metropolis. All the five selected facilities run HIV clinics, but on separate days, from 8am to 3 pm. The teaching hospital, however, runs its clinic from Monday to Fridays. The HIV clinics at the study sites including the teaching hospital do not admit or detain patients. Services provided are strictly on an outpatient basis. Patients whose conditions require further management with intravenous infusions, blood transfusion, intravenous antibiotics, and further monitoring and observation are admitted into the medical wards. Due to this, registered nurses working in these wards were included in the study.

The Kumasi Metropolis is the second largest city in Ghana and serves as the capital of the Ashanti Region (Ghana Statistical Service, 2012). Kumasi is the largest cultural center and one of the biggest tourist attractions cities in Ghana. It is also situated in the middle of Ghana and therefore, serves as a transit point between all corners of the country resulting in the influx of new people every day. Kumasi was selected for this study because cultural attractions and transient nature of the city have made it a prime point for HIV/AIDS prevalence. Kumasi saw a sudden rise in its HIV prevalence at the rate of 3.2% as against previous rates of 2.6% in 2016, 2.7% in 2015 and 2.8% in 2014. (Ghana Web 2018).

3.2. Study population, and sample size estimation

The study population was all the registered nurses employed to work in the HIV units/departments/wards in the selected health facilities in the Kumasi metropolis and met the inclusion criteria. The inclusion criteria included; participants who are qualified nurses and have registered with the nurses and midwifery council of Ghana; participants who have worked in their current unit/department/ward for at least three months; and participants who were between the ages of 18 and 65 years. The total number of participants recruited was proportional to the total number of registered nurses employed to work in the HIV wards/units of the five selected health facility. The clinic (facility A) had a nurse population (N) of 15, the medical center (facility B) has a population of (N = 36), the District hospital (facility C) [N = 55], the University hospital (facility D) [N = 52] and the Teaching hospital (facility E) [N = 146] making the total population 304. The sample size was estimated using a formula developed by Yamane in 1967.

$$n = \frac{N}{1 + N(e)^2}$$

Using a confidence level of 95%, level of precision of 5%, and population size (N) of 304, the estimated sample size was purged at 247.

3.3. Sampling

Within each facility, they have basically male medical and female medical wards (large rooms with beds in hospitals where patients are temporary kept and nursed). However facility E had more wards. Equal samples were drawn from each ward to form the representative sample using the simple random sampling method. For instance, in facility A, the required sample size was 14. Seven (7) participants were selected from each ward. Using the manual lottery system and the attendance register on each day as the sampling frame, the required samples were randomly selected until the desired sample size was achieved. Any nurse who had had a chance to partake in the study was listed and assigned a number in the lottery on subsequent visits. This was done to avoid the repetitive selection of the same participants. Again, if a selected participant failed to report to work on the day of sampling, she/he was excluded from the study.

Co-founding factors were minimized by the;

1. Selection of facilities (private and Government hospitals) who use the same policy guidelines developed by the Ghana AIDS Commission and Ministry of Health, Ghana.
2. Selection of participants who are qualified nurses and are registered with the Nurses and Midwives Council of Ghana. Other factors that helped to minimized co-founders were;
3. Majority of the participants graduated from the same nurses' training institutions within the Metropolis and have passed through the hands of same tutors/lecturers.
4. Curriculum of study developed by the Nurses and Midwives council, Ghana for the nurses' training institutions in Ghana is the same.
5. Often times, seminars/workshops on HIV/AIDS organized for nurses are facilitated by the same agency.

3.4. Data collection

The instrument used in this study was a 48-item self-administered HIV/AIDS KAP questionnaire adapted from Delobelle et al. (2009:1072–73), which was an open-access study based on existing instruments developed for use in nursing by Eckstein (1987) and Froman and Owen (1997). The questions on the said questionnaire were written in English, a language understood and spoken by all participants. English is Ghana's official and standard language used for educational instructions (Embassy, 2018). The questionnaire contained close-ended questions with a fixed number of responses the participants had to choose from. The questionnaire covered the various aspects under study, including the demographic characteristics, training received on aspects of HIV, knowledge, attitudes, and practices related to the care of patients with HIV and AIDS.

The questionnaire was sub-divided into four major sections. The first section consisted mainly of demographic content and variables relating to HIV/AIDS training and care; the second section contained a 28-item HIV/AIDS knowledge scale with statements about disease presentation, transmission, precaution, and prevention. The third section contained a 10-item attitude scale and comprised of items probing empathic and avoidance behaviour. The fourth section consisted of a 10-item practices scale. This consisted of questions relating to universal precautions adherence, the requirement for and availability of post-exposure prophylaxis (PEP) and behavior about HIV testing and referral.

Reliability of the questionnaire was measured using the Cronbach's alpha coefficient. A reliability coefficient for the knowledge and attitude were 0.78 and 0.66 respectively, proving the reliability and acceptability of the instrument. The reliability coefficient obtained for the instrument in this study was similar to that (0.77 and 0.63) obtained in the Delobelle et al. (2009:1072–73) study, though slight modifications were made in the questions. Also, the researcher ensured that care was taken over the accurate phrasing of each question to avoid ambiguity and pre-tested the questionnaire with 15 nurses from the medical wards of Kumasi South Government hospital before the final study.

All questionnaires were hand-delivered by the first author and the answered questionnaires were collected by her. Fieldworkers were not used in this study. Those who satisfied the inclusion criteria, and gave informed consent, were given questionnaires to fill. The researcher waited for the participants to complete the questionnaires while giving them privacy. Those participants that did not have the time to complete the questionnaires were allowed to keep them; these were collected at the participants' given time. Data collection lasted for a period of two months between 10th April and 13th June 2018.

3.5. Assessment of knowledge, attitude, and practices towards HIV/AIDS

The knowledge scale was based on an instrument developed by Eckstein (1987) containing statements about HIV related knowledge and scored as 'True,' 'False' or 'Don't Know.' Correct responses were summed on a 28-point rating scale with higher scores of (1.4–1.8) indicating higher/good knowledge levels and lower scores of (0.6–1.3) indicating lower/poor knowledge.

The attitude scale was based on an instrument developed by Froman and Owen (1997), for measuring attitudes towards patients with HIV and AIDS among nurses. The scale was scored on a five-point Likert scale, ranging from 'Strongly disagree,' 'Neither disagree nor agree,' to 'Strongly agree,' with higher scores of (2.3–3.4) indicating more agreement.

The practice scale contained items that were scored as 'yes', 'no' or 'not applicable,' with higher scores of (1.8–2.0) indicating good practices.

The calculated mean was derived from the summation of all the questions under knowledge, attitude and practice scales.

Ethical consideration

Ethical clearance to conduct the study was obtained from the Higher Degrees Committee of the Department of Health Studies, University of South Africa Research and Ethics. Ethical clearance was also obtained from the Kwame Nkrumah University of Science and Technology (KNUST) Research and Ethics Committee. Permission was sought from the management and authorities of the five health care facilities that were used in the study. Also, the nurses in charge of the various wards in each facility were informed before the administration of the questionnaires. The ethical principles of the Declaration of Helsinki were considered and followed. These were beneficence, and respect for human dignity and justice (Declaration of Helsinki, 2013).

Participants' completion of the questionnaire constituted informed consent as per the University of South Africa Ethics committee. The researcher also left her contact number with each participant to reach her where the need might arise.

3.6. Data analysis

In this study, the different items and responses in the questionnaire were assigned codes and then analysed with Graph Pad Prism 6 and SPSS Version 23. The study findings were presented in descriptive statistics. The descriptive statistics allowed the researcher to use frequency, percentage, mean and standard deviations to describe the data. The results were presented in frequency tables.

4. Results

4.1. Sociodemographic characteristics of study participants

Table 1 shows the socio-demographic characters of participants A majority of the participants were females. The participants' age ranged

Table 1
Shows the socio-demographic characters of participants.

Biographic Data	Frequency (Total = 240)	Percentage
Age (years)		
< 20	8	3.7
20–29	99	41.3
30–39	94	39.1
40–49	22	9.2
50–59	10	4.2
60 >	7	2.9
Gender		
Female	164	68.3
Male	76	31.7
Professional Rank		
Enrolled nurse	17	7.1
Senior Enrolled Nurse	3	1.3
Staff Nurse	107	44.6
Nursing Officer	45	18.6
Senior Nursing Officer	37	15.4
Principal Nursing Officer	28	11.7
Chief Nursing Officer	3	1.3
Education level		
Certificate	38	15.8
Diploma	100	41.7
Degree	71	29.6
Masters	17	7.1
Other	14	5.8
Work Environment		
Public	169	70.4
Private	68	28.3
Other	3	1.3
Professional experience (years)		
< 2	55	22.9
2–5	77	32.1
6–10	60	25.0
11–15	21	8.8
15 >	27	11.2

from 20 to 60 years, with the most represented age group being 20–29 years. A majority of the nurses were staff nurses, and most of them were trained at a level below the first degree. Their work experience ranged from 2 to 15 years, 2–5 years is the range with the highest frequency. The majority were working in public hospitals. A majority reported caring for HIV and AIDS patients very often.

4.2. Training on HIV/AIDS

Table 2 shows responses of participants on training they have received on HIV/AIDS: The participants who did not receive any training in aspects of HIV and AIDS were in the majority (59.2%). Within those who had received training, the majority received their training in TB and HIV (35.2%).When asked on how often they attended workshops/seminars on HIV, Majority had never attended any. Within those who have had the privilege of attending any workshop/seminar on HIV/AIDS, the majority had attended once in their entire professional practice.

4.3. Participants score on knowledge, attitude, and practices

Table 3 shows the frequencies and percentage distribution of participants score on knowledge, attitude and practice: A majority of the participants scored high for knowledge 121(51.9%), attitude 127(54.7%) and practices 128 (56%). The gap between those who scored high and those who scored low for knowledge, attitude and practices is not too great.

Table 2
Shows responses of participants on training they have received on HIV/AIDS.

Variable	Frequency	Percentage
Have you received any training on HIV/AIDS	N = 218	
Yes	89	40.8
No	129	59.2
Specific Areas of training on HIV/AIDS	N = 128	
VCT	22	17.2
PMTCT	19	14.8
STI	12	9.4
TB & HIV	45	35.2
ART	22	17.2
Couple Counseling	6	4.7
Other	2	1.6
Frequency of workshops/seminars attended on HIV/AIDS	N = 211	
Once in my professional practice	34	16.1
Monthly	4	1.9
Quarterly	14	6.6
Twice yearly	12	5.7
Yearly	52	24.6
Never	95	45

NB: VCT = Voluntary counseling and Testing; PMTCT = Prevention of mother to child transmission; STI = Sexually Transmitted Disease; TB & HIV = Tuberculosis & Human immunedeficiency virus; ART = Antiretroviral therapy.

Table 3
Frequencies and Percentage Distribution of participants score on knowledge, attitude and practice.

Variable	Low	High
Knowledge	112(48.1%)	121(51.9%)
Attitude	105(45.3%)	127(54.7%)
Practice	100(44%)	128(56%)

4.4. HIV/AIDS-related knowledge of participants

Table 4 shows the frequency and percentage of participants' response to various questions on the HIV/AIDS knowledge scale: A large number of participants (162, 71.1% p = < 0.0001) knew that adherence to antiretroviral treatment is essential to avoid the development of drug resistance. Additionally, the majority of the respondents (173, 83.2% p = < 0.0001) indicated that people infected with HIV can be asymptomatic, but still infectious. Most of them (199, 83.3% p = < 0.0001) answered that HIV could not be transmitted by casual contact, nor did most of them think that gloves were not necessary when handling body fluids (204, 86.8% p = < 0.0001). More than a quarter of the respondents did not know (60, 26.3% p = < 0.0001) that HIV/AIDS is characterised by a decrease in T-4 lymphocytes, causing an impaired cellular immunity. Almost half of the participants (114, 49.6% p = < 0.0001) did not know that pulmonary TB is classified as a WHO Clinical Stage 2 condition.

4.5. Attitude of participants

Table 5 shows the frequency and percentage of participants' response to various questions on the HIV/AIDS Attitude scale: The majority (135, 58.4% p = < 0.0001) strongly disagreed that people with HIV/AIDS only have themselves to blame. When respondents were asked whether they needed to worry about putting their family and friends at risk of contracting the disease when caring for a person with HIV/AIDS, most of them either strongly disagreed (71, 30.7% p = < 0.0001) or just disagreed (100, 43.3% p = < 0.0001). Many of the respondents strongly agreed (149, 64.8% p = < 0.0001) or agreed (59, 25.7% p = < 0.0001) that patients with HIV/AIDS have the right to the same quality of care as any other patient. Half of them responded

Table 4
Frequency and percentage of participants' response to various questions on the HIV/AIDS knowledge scale.

HIV/AIDS Knowledge Scale	TRUE	FALSE	Don't know	P-value
1. HIV can be transmitted by casual contact	20(8.4)	199(83.3)	20(8.4)	< 0.0001
2. HIV can been transmitted to people receiving blood transfusion	188(81.4)	31(13.4)	12(5.2)	< 0.0001
3. The HI virus can easily be killed with disinfectant in the environment	10(5.2)	161(83.9)	21(10.9)	< 0.0001
4. HIV is highly contagious	70(31.1)	128(56.9)	27(12.0)	< 0.0001
5. HIV/AIDS is characterized by a decrease in T-4 lymphocytes, causing an impaired cellular immunity	147(64.4)	21(9.2)	60(26.3)	< 0.0001
6. A person with antibody to the virus is protected against HIV/AIDS	35(15.4)	153(67.4)	39(17.2)	< 0.0001
7. All pregnant women infected with HIV will have babies born with AIDS	12(5.2)	210(91.3)	8(3.5)	< 0.0001
8. Gloves are not necessary when handling body fluids	25(10.6)	204(86.8)	6(2.6)	< 0.0001
9. Following an accidental needle stick, there is a greater likelihood of infection with hepatitis B than with HIV/AIDS	82(35.8)	110(48.0)	37(16.2)	< 0.0001
10. People infected with HIV can be asymptomatic, but still infectious	173(83.2)	26(12.5)	9(4.3)	< 0.0001
11. It is possible to transmit the virus to family members of a nurse providing care for persons with HIV/AIDS, even though the nurse is not infected	52(22.3)	158(67.8)	23(9.9)	< 0.0001
12. The risk of infection with HIV after an accidental needle stick injury at the work place is high	163(69.4)	53(22.6)	19(8.1)	< 0.0001
13. An individual may be infected with HIV even if he/she tests negative for HIV/AIDS antibodies	122(52.1)	68(29.1)	44(18.8)	< 0.0001
14. A person can be infected with HIV for 5 years or more without getting AIDS	172(73.5)	34(14.5)	28(12.0)	< 0.0001
15. The risk of occupational HIV infection and transmission among health workers is high	180(73.1)	38(15.4)	28(11.4)	< 0.0001
16. Gloves and gowns are required for any contact with patients with HIV/AIDS	153(65.7)	69(29.6)	11(4.7)	< 0.0001
17. One should suspect the diagnosis of HIV/AIDS in young persons who present with Kaposi's sarcoma	143(62.7)	29(12.7)	56(24.6)	< 0.0001
18. The risk of transmission of HIV during mouth to mouth resuscitation is extremely low	119(50.9)	85(36.3)	30(12.8)	< 0.0001
19. To prevent accidental injury, contaminated needles should be recapped immediately after use on patients with HIV/AIDS	142(59.2)	85(35.4)	13(5.4)	< 0.0001
20. Pregnant health care workers are at greater risk of contracting HIV infection at the workplace	39(16.7)	173(73.9)	22(9.4)	< 0.0001
21. HIV can be easily transmitted through saliva, sweat and tears	43(18.4)	173(73.9)	18(7.7)	< 0.0001
22. TB can be prevented in people living with HIV/AIDS using TB preventive therapy	104(44.6)	88(37.8)	41(17.6)	< 0.0001
23. TB treatment is the same whether a patient is infected with HIV or not	142(60.9)	57(24.5)	34(14.6)	< 0.0001
24. Most HIV-positive TB patients have no symptoms or signs of HIV disease	37(16.1)	147(64.2)	45(19.7)	< 0.0001
25. Pulmonary TB is classified as a WHO clinical stage 2 condition	67(29.1)	49(21.3)	114(49.6)	< 0.0001
26. Cotrimoxazole is not recommended for persons presenting with symptomatic HIV disease	34(14.8)	125(54.3)	71(30.9)	< 0.0001
27. HIV-positive patients with a CD4-count < 200 should be assessed for antiretroviral treatment	135(58.7)	30(13.0)	65(28.3)	< 0.0001
28. Adherence to antiretroviral treatment is essential to avoid the development of drug resistance	162(71.1)	35(15.4)	31(13.6)	< 0.0001

that they strongly agree (116, 50.2% p = < 0.0001) that all patients with HIV/AIDS are entitled to confidentiality, even if it puts other people at risk of contracting the disease.

4.6. HIV/AIDS-related practices of participants

Table 6 shows the frequency and percentage of response to various questions on the HIV/AIDS practice scale: Majority of the participants (194, 86.2% p = < 0.0001) practiced universal blood and body fluid precautions in the workplace. Most participants (212, 92.6% p = < 0.0001) report having worn gloves the last time they took a blood sample. A majority of participants knew about the availability of PEP services at their workplace, but (25, 11.0% P = < 0.0001) would not consider starting PEP after needle pricks. A low response rate in the affirmative was also recorded when participants were asked if they recapped needles immediately after using them (56, 24.6% p = < 0.0001).

5. Discussion

The overall knowledge of the nurses in this study was satisfactory, as similar to the findings of Famoroti, Fernandes, and Chima (2013:6) and Shahzadi, Kousar, Jabeen, Waqas, and Gilani (2017:162). It must be noted that the study participants for Famoroti et al. (2013:6) were student nurses, but remains worth comparing. About 81% could correctly identify blood transfusion as a mode of HIV transmission. This is consistent with the findings of Marranzano et al. (2013:4) and Shahzadi et al. (2017:162) that nurses have correct knowledge of HIV transmission. Nonetheless, some of the nurses sampled still hold erroneous views or misconceptions about HIV and its transmission. A significant proportion (22.3%) said it is possible to transmit the virus to family members of a nurse providing care for persons with HIV/AIDS, even though the nurse is not infected. This should be a cause for worry since such wrong knowledge could inform nurses' discriminatory or unethical attitudes towards patients living with the virus. A similar observation is made by Wu et al. (2016:366) and Iwoi et al. (2017:5).

A substantial number of them had incorrect knowledge about HIV and AIDS management, HIV transmission and prevention/precautions. The inadequacy of knowledge displayed by participants in this study may be attributable to the lack of training on HIV through workshops and seminars. A majority (59.2%) of the nurses in this study admitted to not receiving any training on HIV and AIDS, even though the nature of their job requires them to care for HIV infected patients. It was also pitiful to note that the majority (45%) of the nurses had never attended any in-service training on HIV and AIDS. Of those who have had the privilege of attending in-service training, the majority had attended once in their entire professional practice. This study agrees with the suggestions of Pal, Chattopadhyay, Mandal, and Biswas (2016:130) and Okpala et al. (2017:547-553) regarding the need for continuous professional training for nurses involved in the management and care of PLWHA to boost their HIV-related knowledge and competence. In-service training on HIV and AIDS has been associated with an excellent display and retention of HIV-related knowledge among nurses. In India, 17% of the nurses had 'excellent' knowledge, thus a knowledge score of 90%, while about 77% had a moderate level of knowledge (score of 70–90%). This was after they had received in-service training a year before the survey (Pal et al., 2016:130).

Several studies have reported that nurses generally have favourable attitudes towards persons living with HIV and AIDS (Ishimaru et al., 2017:5; Ledda et al., 2017:5; Zarei, Joulaei, Darabi, & Fararouei, 2015:297). Similarly, the results of this study showed that the nurses have positive attitudes, with the majority showing greater agreement with positive statements, and more disagreement with negative statements about PLWHA. Majority of the nurses 149(64.8%) and 144(59.5%) strongly agreed with the statements 'patients with HIV/AIDS have the right to the same quality of care as any other patient' and 'patients with HIV/AIDS should be treated with the same respect as any other patient.' This was quite encouraging and needs to be commended, considering their demonstration of fear of contracting the virus and transmitting to their families. The findings of this study are in congruence with a study by Ledda et al. (2017:5), that although nurses have fears for contracting HIV, their consciences and integrity allowed

Table 5
Frequency and percentage of participants' response to various questions on the HIV/AIDS Attitude scale.

HIV/AIDS Attitude Scale	Strongly disagree	Disagree	Neither	Agree	Strongly agree	p-value
1. Most people with HIV/AIDS only have themselves to blame	135(58.4)	59(25.5)	25(10.8)	7(3.0)	5(2.2)	< 0.001
2. When admitted to hospital, patients who are HIV-positive should not be put in rooms with other patients	79(34.1)	109(47.0)	11(4.7)	17(7.3)	16(6.9)	< 0.001
3. When caring for a person with HIV/AIDS, you need to worry about putting your family and friends at risk of contracting the disease	71(30.7)	100(43.3)	18(7.8)	24(10.4)	18(7.8)	< 0.001
4. Patients with HIV/AIDS have the right to the same quality of care as any other patient	4(1.7)	11(4.8)	7(3.0)	59(25.7)	149(64.8)	< 0.001
5. It is especially important to work with patients with HIV/AIDS in a caring manner	10(4.4)	8(3.5)	13(5.7)	109(47.8)	88(38.6)	< 0.001
6. Patients with HIV/AIDS should be treated with the same respect as any other patient	6(2.5)	11(4.5)	9(3.7)	72(29.8)	144(59.5)	< 0.001
7. Healthcare workers are worried about getting HIV/AIDS from caring for a person with HIV/AIDS in their work environment	22(9.5)	39(16.8)	31(13.4)	88(37.9)	52(22.4)	< 0.001
8. Health care workers are sympathetic towards the misery that people with HIV/AIDS experience	13(5.6)	33(14.2)	47(20.3)	105(45.3)	34(14.7)	< 0.001
9. Nurses have little sympathy for people who get HIV/AIDS from sexual promiscuity	79(34.2)	56(24.2)	37(16.0)	34(14.7)	25(10.8)	< 0.001
10. All patients with HIV/AIDS are entitled to confidentiality, even if it puts other people at risk of contracting the disease	28(12.1)	30(13.0)	8(3.5)	49(21.2)	116(50.2)	< 0.001

them to display some positive attitudes by accepting PLWHA. The fear and anxiety is revealed in their responses to the statements 'healthcare workers are worried about getting HIV/AIDS from caring for a person with HIV/AIDS in their work environment' (60.3% showing agreement) and 'when caring for a person with HIV/AIDS, you need to worry about putting your family and friends at risk of contracting the disease' (18.2% showing agreement). This notwithstanding, it ought to be a cause for concern since these erroneous beliefs tend to create a feeling of 'not being safe,' and therefore, lead to stigmatisation and discriminatory attitudes towards PLWHA.

While nurses are mandated by the ethics of their profession to respect the patients' right to confidentiality and keep information obtained in associates with clients to themselves (Dapaah & Senah, 2016:8), 25.1% of the nurses in this study showed disagreement with the following statement: 'All patients with HIV/AIDS are entitled to confidentiality, even if it puts other people at risk of contracting the disease' ($p \leq 0.0001$). This is the indication of their tendency to disclose PLWHA HIV status to others. In China, 46.4% of health workers disclosed a patient's HIV status to a colleague who was not directly involved in the care of such a patient (Doda, Negi, Gaur, & Harsh, 2018:21-30). In Thailand, Pudpong, Srithanaviboonchai, Chariyalertsak, Chariyalertsak, Smutraprapoot, Sirinirund, Siraprapasiri, Ongwandee, Benjarattanaporn, Otto, and Nyblade (2014:6) showed a third (1/3) of the samples had their HIV status disclosed to other people without their consent by health workers.

Acts of discriminatory attitudes emanating from fear of contagion were also shown in their quest to put on gowns and gloves with any contact with PLWHA (65.7%). Similar to the findings of this study, a study in KwaZulu-Natal, South Africa found 51% percent of the health workers wore gloves for non-invasive procedures on HIV-positive patients (Famoroti et al., 2013:6). Also, a study in Thailand found 31.8% of health workers using unnecessary personal protection measures, such as wearing double gloves when interacting with people living with HIV (Pudpong et al. 2014:1).

Similar to other studies (Famoroti et al., 2013:6; Zarei et al., 2015:298), this study found that a fraction of the nurses had prejudicial attitudes towards PLWHA. A quarter of the population (25.5%) responded in the affirmative 'nurses have little sympathy for people who get HIV/AIDS from sexual promiscuity' ($p \leq 0.0001$). The percentage of nurses displaying prejudicial attitudes in this study was, however, lower than that recorded in the Famoroti et al. (2013:6) (54.5%), Pudpong et al. (2014:6) (42.5%) and Pal et al. (2016:130) (50–83%) study.

The practice of universal precautions by nurses was not adequate, but it can be said to be satisfactory, as the majority responded to adhering to the right practices. This is consistent with the findings of Som et al. (2015:18). The majority (92.6%) wore gloves before examining patients. The increased compliance with this precaution is consistent with the report by Beckers' Hospital Review (2016). In their report, it was stated that the precaution with the highest compliance rate was wearing gloves (92%).

Contrary to the CDC guidelines which note that to prevent needle stick injuries, health workers are mandated to discard used needles immediately after use and not recap them (Wisconsin Department of Health Service, 2018), some 25.6% of nurses in this study recapped needles after use. The findings of this study contradict those of Chalya et al. (2015:10) and Pal et al. (2016:130). The majority (76.7%) washed hands before examining patients. The percentage of nurses practicing hand washing is relatively lower than the 82% recorded in Beckers' Hospital Review (2016) but higher than the 65% recorded in the study by Pal et al. (2016:130). The 19% who did not wash their hands before examining patients indicate that some nurses poorly practice universal precaution and will, therefore, need further training on the importance of hand washing. According to Suri and Gopaul (2018:2) as well as Chatrath (2017:3), mandatory hand hygiene before and after contact with patients is the most significant procedure for preventing cross-

Table 6
Frequency and percentage of responses to various questions on the HIV/AIDS practice scale.

HIV/AIDS Practice Scale	Yes	No	N/A	P-value
1. Do you encourage people to get tested and counseled for HIV/AIDS?	208(91.2)	10(4.4)	10(4.4)	< 0.0001
2. Do you refer people for voluntary counseling and testing, even if these services are not available at your workplace?	180(78.9)	31(13.6)	17(7.5)	< 0.0001
3. Do you know HIV/AIDS service providers or recognized organization in your area where you can refer your patients to?	158(69.3)	56(24.6)	14(6.1)	< 0.0001
4. Do you practice universal blood and body fluid precautions at your workplace?	194(86.2)	13(5.8)	18(8.0)	< 0.0001
5. The last time you took a blood sample, did you wear gloves?	212(92.6)	11(4.8)	6(2.6)	< 0.0001
6. Do you wash your hands before examining a patient?	174(76.7)	45(19.8)	8(3.5)	< 0.0001
7. Do you recap needles immediately after using them?	56(24.6)	166(72.8)	6(2.6)	< 0.0001
8. Do you treat blood spills on floors or other surfaces with a disinfectant before cleaning up?	207(90.8)	14(6.1)	7(3.1)	< 0.0001
9. Do you have post-exposure prophylaxis (PEP) at your workplace?	177(78.7)	21(9.3)	27(12.0)	< 0.0001
10. Did you ever consider starting PEP after an occupationally acquired needle stick injury?	169(74.4)	25(11.0)	33(14.5)	< 0.0001

contamination.

It was worrying to note that a proportion of them (21.3%) were not aware of the availability of PEP services in their facility. Seventy-eight percent (78.7%) were, however, aware of the availability of PEP in their workplace. This is consistent with the findings of Mathewos et al. (2013:4) (88%) and Habib, Baye, Awole, and Abebe (2018:8) (95.3%). The differences in the percentages may be attributed to the differences in the samples and the formal training their participants received on PEP. A few (25.5%) would not consider starting PEP after exposure to HIV. Their reason for refusing to go on PEP after accidental exposure to HIV was not known since the study did not make enquiries about their reasons for refusal. However, previous studies have cited side effects of anti-retroviral drugs as a reason for poor uptake of PEP by nurses (Mill, Nderitu, & Richter, 2014:14; Chalya et al., 2015:12).

6. Conclusion

The overall knowledge of the nurses was satisfactory; however, some had inadequate knowledge and misconceptions about HIV transmission. The study also found that nurses generally have fear of contracting the virus. Despite their increased fear of contagion, the majority displayed a positive attitude towards PLWHA. Fear of contagion was associated with erroneous beliefs about HIV transmission, leading to negative attitudes. Their compliance with universal precautions was satisfactory nonetheless, some of the participants still refused to adhere to basic universal precautions such as hand washing. The need for continuous in-service training of nurses on HIV and AIDS is a key contributing factor to promoting knowledge, correcting a misconception, favourable attitude and improve compliance to universal precautions and other preventive practices such as uptake of PEP.

7. Recommendations

The Ministry of Health in Ghana ought to create opportunities for ongoing training and development of nurses. This can be facilitated by nurse managers through in-service training that specifically addresses nurses' knowledge gaps in HIV transmission, management, and preventive measures. Training should be based on policies and research evidence on HIV and AIDS.

Hospitals in Ghana ought to collaborate to create nurses' platforms through the establishment of journal clubs or focus groups. This will allow nurses from different hospitals to discuss issues relating to HIV/AIDS as well as report on new evidence and updates on HIV/AIDS. To ensure that this becomes effective, nurses ought to have free access to the internet, especially at the workplace.

Nurses and Midwives Council of Ghana ought to integrate the education of basic aspects of HIV/AIDS into the curricula of undergraduate nurses to help them develop the competencies required to care for HIV and AIDS patients.

8. Limitation and strength

The study was carried out at five selected hospitals in the Kumasi metropolis and the results may therefore only apply to similar settings. This means that the results and conclusions from this study cannot be generalised to other areas, particularly in different settings. Interviewer bias was minimised through the use of self-administered questionnaires.

This study, however, had some strength, where it seems to be the first of its kind to be conducted in Ghana. Findings from this study will help the Government and the Ghana AIDS Commission to devise policies and educational strategies meant to equip nurses with the right prerequisite knowledge needed to dispense their duties to PLWHA in a way that conforms to the ethics of their profession.

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Ethical approval details

Ethical clearance to conduct the study was obtained from the Higher Degrees Committee of the Department of Health Studies, University of South Africa Research and Ethics. Ethical clearance was also obtained from the Kwame Nkrumah University of Science and Technology (KNUST) Research and Ethics Committee.

Declaration of Competing Interest

There are no organisations with conflict of interest related to the study. The authors declare that they have no financial or personal relationship that might have inappropriately influenced the writing of this paper.

Appendix A. Supplementary data

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