

## HEALTH CARE WORKERS' KNOWLEDGE ON HIV AND AIDS: UNIVERSAL PRECAUTIONS AND ATTITUDE TOWARDS PLWHA IN BENIN-CITY, NIGERIA

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### ABSTRACT

**Objective:** Health care workers are at risk of becoming infected with blood-borne pathogens, including HIV. The study was designed to test health care workers knowledge about HIV transmission, universal precautions and their attitude towards people living with HIV and AIDS.

**Design:** A cross-sectional study.

**Setting:** University of Benin Teaching Hospital, Benin-City, Nigeria.

**Participants:** 120 Health Care Workers (HCWs) who were occupationally exposed to patient's blood and body fluids completed a self administered structured questionnaire between March and May 2004. The HCWs consisted of 50 doctors drawn from obstetrics and gynaecology (25) and surgery departments (25). 70 nurses from accident and emergency unit (23), labour ward (18), labour ward theatre (4), main surgical theatre (22) and family planning clinic (3).

**Results:** The mean age of the health care workers and duration of practice were  $39.8 \pm 8.0$  years and  $14.0 \pm 8.2$  years respectively. Though many of the respondents demonstrated good knowledge about HIV transmission, more than 25% of them thought that HIV could be transmitted through saliva, vomit, faeces and urine. They over estimated their risk of acquiring HIV infection following needle stick injury, exposure of mucocutaneous membrane and intact skin to infected blood and body fluids. There was poor adherence to universal precautions which was attributed to lack of knowledge and availability of materials in 48% and 60% of the workers respectively. Over 40% of the health care workers exhibited discriminatory attitude towards people living with HIV and AIDS. There was no statistical significant difference ( $p > 0.05$ ) in the knowledge of HIV and AIDS transmission and infection prevention practices amongst the doctors and nurses. Similarly there was no significant difference in their discriminatory attitude towards PLWHA.

**Conclusion:** We recommend that seminars, workshops should be organized on a continuous basis for health care workers on universal precautions, stigma and discrimination reduction. Those trained should train others on the job. The institution should also make available materials needed to protect workers against the risk of acquiring pathogenic infection in the course of providing health services to their patients.

**Key words:** HCW'S knowledge: HIV & AIDS, universal precautions: attitude towards PLWHA.

### INTRODUCTION

Globally 40 million people were estimated to be living with HIV and AIDS at the end of 2001, 28.5 million of which are in Sub-Saharan Africa. Though Africa contributes only 11% of the world population of 6 billion by 2002, Sub-Saharan Africa accounts for more than 70% of all HIV and AIDS cases in the world. AIDS is now regarded as the leading cause of death in Sub-Saharan Africa<sup>1</sup>. With this background, health care workers in developing countries are at serious risk of infection from blood

borne pathogens particularly hepatitis B, C and HIV because of the high prevalence of such pathogens in many poorer regions of the world<sup>2,3</sup>.

Although a large proportion of the world's HIV infected population lives in Sub-Saharan Africa; only 4% of the world cases of occupational HIV infection are reported from these regions<sup>4,5</sup>. This is in contrast to the 4% of the world's HIV infective patients living in Western Europe and North America but with 90% of documented occupational HIV infections<sup>4,5</sup>.

In developing countries the risk of occupational transmission of blood borne pathogens is increased by excessive handling of contaminated needles that

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results from common unsafe practices<sup>2,3,6,7</sup>, coupled with poor infection prevention practices. Although the prevalence of HIV infection among persons attending health care facilities cannot be altered and continues to rise<sup>8</sup>, the frequency of exposures can be modified<sup>9</sup>.

In 1987, guidelines for safe working routines were issued in an attempt to reduce the risk of exposure to blood and other potentially infectious body fluids<sup>10</sup>. Because the infectious status of a patient is unknown<sup>11,12</sup>, a central issue of the guideline was the introduction of the principle of universal precautions; that is the guidelines, should be applied to all procedures during which a risk of exposure is anticipated regardless of the perceived infectious status of the patients<sup>10</sup>. However several studies had indicated that compliance with these guidelines was poor<sup>13-20</sup>.

Stigma and discrimination are features of HIV disease and many people who are HIV positive reported that their lives are affected by fear of discrimination<sup>21-23</sup>. Many health care providers have stigmatizing attitude and behaviour towards people living with HIV and AIDS<sup>23,24</sup> and these are major obstacles to effective HIV and AIDS prevention<sup>25</sup>. Health care workers however feel at risk because of their exposure to the virus in the course of providing health services to their patients.

This study was therefore conducted to find out the knowledge of doctors and nurses (who were occupationally exposed to patient's blood in the University of Benin Teaching Hospital, Benin-City, Nigeria) about HIV transmission, their adherence to infection prevention practices and attitude towards people living with HIV and AIDS with a view to bring about positive changes.

## MATERIALS AND METHOD

This was a cross-sectional study that took place between March and May 2004 at the University of Benin Teaching Hospital, Benin-City, Edo State, Nigeria. It involved doctors and nurses who were by their daily duty occupationally exposed to blood and body fluids of the patients they treat. The sample size for the study was calculated using the formula<sup>26</sup>  $n = pq/(e/1.96)^2$ ; where n: represented the desired sample size, p: prevalence of the problem. (Compliance to infection prevention practices estimated to be poor in studies<sup>27</sup> was assumed for this study to be  $p = 5\%$ ), q: is  $1-p$  represented by those compliant to practices of infection prevention, e: error margin taken as 0.05, 1.96: is a constant. Though the sample size calculated was 73, 120 health care workers were recruited to increase the power of the study. They were 50 doctors, 25 each drawn from obstetrics and gynaecology and surgery departments. 70 nurses were drawn from accident and emergency unit (23), labour ward (18), labour ward theatre (4), main surgical theatre (22) and family planning clinic (3).

They completed a structured self administered questionnaire designed to collect information on demographic data, knowledge of HIV transmission, infection prevention practices and attitude towards people living with HIV and AIDS. The questionnaire was pre-tested to ensure that all questions were relevant and were easy to understand and to answer and were given to the respondent on the basis of first seen. 94 respondents returned the forms from the following areas; obstetric and gynaecology and surgery departments 12 and 23 respectively. Accident and emergency unit 18, labour ward 18, labour ward theatre 4, main surgical theatre 16 and family planning clinic 3; given a response rate of 78.3%. The other participants refused to participate in the study despite anonymity of the study. Data analysis was based on the returned forms using chi-square test where applicable to test the responses of the different groups. The level of significance was set at 5%.

## RESULTS

The questionnaire of the 35 doctors from obstetrics and gynaecology department (12) and surgery department (23) were cross-tabulated with those of the 59 nurses from accident and emergency unit (18), labour ward (18), labour ward theatre (4), main surgical theatre (16) and family planning clinic (3). The findings did not show any statistical significant difference ( $p > 0.05$ ) in the knowledge of HIV and AIDS patients and infection prevention practices amongst the doctors and nurses. Similarly the attitude of both groups towards PLWHA was not statistically different. In order not to make the results cumbersome; the doctors and nurses were referred to as HCWS and the results presented as simple percentages.

The mean age and duration of practice of the doctors and nurses were  $39.8 \pm 8.0$  years and  $14.0 \pm 8.2$  years respectively. There were more females (61.7%) than males (38.3%) in study (Table 1). A large proportion of the health care workers (HCWs) knew that HIV is transmitted through sexual (83%) and blood contacts (100%) and through vertical transmission from mother to child (84%-94%). Similarly 100% of the respondents were aware that HIV cannot be transmitted through casual contact. However 14.9%- 38.3% still thought that HIV could be contacted through tears, saliva, vomit, feces and urine (Table 2).

Majority of the HCWs 59.6% (56), 45.7% (43) and 35.1% (33) overestimated their risk of HIV infection following needle stick injury, exposure of the mucous membranes and intact skin respectively to HIV infected blood. While over 22% did not know their actual risk (Table 3).

78.7% (74) did not know the steps of processing instruments immediately after use as decontamination, cleaning using brush with detergent

and water followed by sterilization or high level disinfection (Table 4).

There was poor compliance to washing of hands before patient was examined (31%) 29 and before putting on gloves for clinical procedures 38% (36). However 83% of the HCWs washed their hands following examination of their patients and 87% after touching instruments that might be contaminated with blood or body fluids (Table 5).

There was good compliance (72%-91%) with wearing of gloves in performing procedures, even though few of the workers 20.2% (19) might sometime not wear gloves to draw blood from patients (Table 5).

Only 27.6% (26) and 34% (32) did not recap nor detach needles from syringes. Disposal of needles and medical waste were only rightly done by 43.6% (41) and 33% (31) of the HCWs respectively (Table 5).

There was poor compliance with surgical attires that protect service providers from exposure to patient's potentially infectious blood and body fluids especially in the use of eye protection where 68.1% (64) did not use them during procedures involving blood splashes. Only 20.2% (19) of the HCWs made use of "hands-free" technique for passing sharps during clinical procedures. Most of the health care workers 87.2% (82) did not decontaminate their instruments immediately after use (Table 5).

In response to poor compliance about universal precautions, 19.1% (18) of the workers claimed that they often forget, 47.9% (45) said they did not know some of the practices, while 60.6% (57) said the materials for some of the universal precautions were not always available.

With regards to attitude of the HCWs to HIV patients, 44.7% (42) of the workers believed that most of the HIV positive HCWs got infected at work and 43.6% (41) believed that people infected with HIV should be isolated from other patients to protect the larger population. 39.4% (37) believed that they are at high risk of becoming infected with HIV working in a health facility; while 73.4% (69) felt

that HIV positive patients' charts should be coded to indicate their status. 33% (31) of the providers were not comfortable providing health services to clients who are HIV positive neither were 63.8% (60) and 57.4% (54) comfortable performing surgical procedures on patients who are HIV positive or patients whose status were unknown respectively.

More than 43.6% (41) were uncomfortable in being assisted or sharing bathroom with a colleague who is infected with HIV. 33% (31) of the workers avoided performing any task at work without wearing latex gloves (Table 6).

**Table 1: Demographic characteristics of respondents**

<b>Personal characteristics</b>	<b>Health care workers</b>	<b>Percentage %</b>
<b>Age</b>		
20-29	9	9.6
30-39	40	42.5
40-49	29	30.9
50-59	16	17.0
≥60	0	0
Total	94	100
<b>Duration of practice (years)</b>		
<5	10	10.6
5-9	21	22.3
10-14	20	21.3
15-19	14	14.9
20-24	15	16.0
25-29	9	9.6
≥30	5	5.3
Total	94	100
<b>Sex</b>		
Male	36	38.3
Female	58	61.7
Total	94	100

**Table 2: Health care worker's knowledge about HIV transmission (N=94)**

HIV Transmission	Yes (%)	No (%)	Not know (%)
<b>Transmission through sexual contact:</b>			
Oral	78 (83)	15 (16.0)	1 (1.0)
Anal	90 (95.7)	4 (4.3)	0 (0)
Vaginal	100 (100)	0 (0)	0 (0)
<b>Transmission through blood contact:</b>			
Injections/ Needles (sharing needles, IV drugs, injury from contaminated needles or sharp objects).	94 (100)		
Cutting tools (using contaminated razor blades circumcision instruments).	94 (100)		
Transfusions (receiving infected blood or blood products)	94 (100)		
Contact with broken skin (exposure to blood through cuts or lesions)	94 (100)		
<b>Mother to child transmission during:</b>			
Pregnancy	79 (84.0)	10 (10.7)	5 (5.3)
Delivery	84 (89.4)	8 (8.5)	2 (2.1)
Breast feeding	88 (93.6)	4 (4.3)	2 (2.1)
<b>Others:</b>			
Social or casual contact		94 (100)	
Touching		94 (100)	
Dry kissing	3 (3.2)	90 (95.7)	1 (1.1)
Shaking hands	1 (1.1)	92 (97.8)	1 (1.1)
Toilet seats	2 (2.1)	91 (96.8)	1 (1.1)
Insect bites	1 (1.1)	92 (97.8)	1 (1.1)
Massaging another person	1 (1.1)	92 (97.8)	1 (1.1)
Masturbation	1 (1.1)	92 (97.8)	1 (1.1)
Living with a person with HIV	5 (5.3)	89 (94.7)	0 (0)
Tears	14 (14.9)	77 (81.9)	3 (3.2)
Saliva	36 (38.3)	56 (59.6)	2 (2.1)
Vomit	25 (26.6)	66 (70.2)	3 (3.2)
Feces	25 (26.6)	66 (70.2)	3 (3.2)
Urine	26 (27.7)	65 (69.1)	3 (3.2)

**Table 3: Risk of HIV infection as perceived by the respondents (N= 94)**

Type of risk	% of risk	No of health care workers (%)
Risk of HIV infection after a needle stick or cut exposure to HIV infected blood	1.5	11 (11.7)
	2.0	9 (9.6)
	0.3	17 (18.1)
	2.5	36 (38.3)
	Not know	21 (22.3)
Risk of HIV infection after exposure of eye, nose, mouth to HIV infected blood	5	12 (12.8)
	0.1	29 (30.9)
	3.5	10 (10.6)
	1.0	21 (22.3)
	Not know	22 (23.4)
Risk of HIV infection after exposure of the intact skin to HIV infected blood	>3.0	16 (17.0)
	>1.5	6 (6.4)
	<0.1	38 (40.4)
	1.0	11 (11.7)
	Not know	23 (24.5)

**Table 4: Processing of used instruments**

What is done immediately after use of instruments	Number of health care workers N= 94	Percentage
*Correct practice	20	21.3
**Incorrect practice	74	78.7

\*Correct practice include the following response: Decontamination of reusable instruments immediately after use followed by cleaning using brush with detergent, rinsing of the instruments with water followed by sterilization or high level disinfection.

\*\* Incorrect practice: Any answer that does not follow the right sequence of processing of the used instruments

**Table 5: Measures taken to prevent transmission of infection. (N= 94)**

Preventive measures taken to prevent transmission of infections through injuries/accidents	All the time (%)	Sometimes (%)	Not at all (%)	Not applicable (%)
<b>Washing of hands:</b>				
Immediately after arriving at work	24 (25.5)	24 (25.5)	46 (49.0)	
Before examining each patient	29 (30.9)	32 (34.0)	33(35.1)	
After examining each patient	81 (86.2)	0 (0)	13 (13.8)	
Before putting on gloves for clinical procedure.	36 (38.3)	31 (33)	27 (28.7)	
After removing gloves	78 (83.0)	15 (16)	1 (1.0)	
After touching any instruments that might be contaminated with blood or body fluid.	82 (87.2)	12 (12.8)		
Before leaving work at the end of the day	54 (57.4)	37 (39.4)	3 (3.2)	
<b>Wearing of gloves when:</b>				
Performing vaginal examination	91 (96.8)	0 (0)	0 (0)	
Taking delivery	89 (94.7)	0 (0)	0 (0)	
Drawing blood	72 (76.6)	17 (18.1)	2 (2.1)	
Cleaning blood	87 (92.6)	5 (5.3)	2 (2.1)	3 (3.2)
Disposing of instruments	80 (85.1)	11 (11.7)	3 (3.2)	5 (5.3)
Handling contaminated linen	84 (89.4)	7 (7.4)	3 (3.2)	3 (3.2)
Do you clean and cover sores/cuts/rashes on your hand with water proof plaster?	75 (79.8)	17 (18.1)	2 (2.1)	
Do you recap needles?	26 (27.6)	39 (41.5)	29 (30.9)	
Do you detach the needles from syringes after use?	32 (34.0)	29 (30.9)	33 (35.1)	
Do you dispose of your needles/sharps in puncture resistant containers after use?	41 (43.6)	27 (28.7)	26 (27.7)	
Do you dispose of your medical waste in leak proof containers after use?	31 (33.0)	35 (37.2)	28 (29.8)	
Do you wear double gloves during surgery?	46 (49.0)	24 (25.5)	24 (25.5)	
Do you wear eye protection when performing procedures that will produce blood splashes?	19 (20.2)	11 (11.7)	64( 68.1)	
Do you wear face mask for procedures that is likely to have blood splashes?	53 (56.4)	25( 26.6)	16 (17.0)	
Do you wear water proof apron during surgery?	40 (42.5)	29 (30.9)	25 (26.6)	
Do you wear water proof boots during surgical procedure?	47 (50.0)	21 (22.3)	26 (27.7)	
Do you use the hands-free technique for passing instruments/sharps during surgery?	19 (20.2)	11 (11.7)	56 (59.6)	
Do you decontaminate used instruments immediately after use in 0.5% chlorine solution?	8 (8.5)	4 (4.3)	82 (87.2)	8 (8.5)

**Table 6. Attitudinal responses of health care workers towards people living with HIV and AID (N= 94)**

S/n	Attitude of health care workers	Agree No. (%)	Disagree No. (%)
1.	People who are infected with HIV should not be treated in the same area as other patients in order to protect them from infection.	41 (43.6)	44 (46.8)
2.	People who are infected with HIV are responsible for getting infected.	26 (27.7)	64 (68.1)
3.	Most HIV positive health care workers get infected at work	42 (44.7)	49 (52.1)
4.	HIV patients are threat to my safety at my facility.	22 (23.4)	67 (71.3)
5.	Sharing one's HIV status is not the right thing to do, whether a patient or a health care worker	28 (29.8)	57 (60.6)
6.	Health care workers who are HIV positive should be allowed to continue to provide services.	60 (63.8)	28 (29.8)
7.	HIV positive patients' charts should be marked to indicate their status.	69 (73.4)	22 (23.4)
8.	All HIV positive patients should be sterilized.	16 (17.0)	70 (74.5)
9.	I feel that I am at high risk of becoming infected with HIV working in a health facility.	37 (39.4)	51 (54.3)
10.	I feel that providing health services to people with HIV and AIDs is a waste of resources since they are all going to die.	6 (6.4)	85 (90.4)
11.	People who have sexual relations with people of the same sex have a right to access good quality health services in my hospital	45 (47.9)	42 (44.7)
12.	People who are commercial sex workers have a right to access good quality health services in my facility	53 (56.4)	33 (35.1)
13.	I avoid performing any task at work on patients without wearing latex gloves	31 (33.0)	58 (61.7)
14.	I avoid touching patients' clothing for fear of contacting HIV.	8 (8.5)	81 (86.2)
15.	I avoid touching patients for fear of becoming infected with HIV	9 (9.6)	80 (85.1)
16.	I am comfortable performing surgical procedures on patients who have HIV/AIDS	27 (28.7)	60 (63.8)
17.	I am comfortable performing surgical procedures on patients whose HIV status is unknown.	34 (36.2)	54 (57.4)
18.	I am comfortable providing treatment for patients who are HIV positive.	57 (60.6)	31 (33.0)
19.	I am comfortable talking with patients who have HIV / AIDS	71 (75.5)	19 (20.2)
20.	I am comfortable talking with patients who are at risk of HIV infection.	75 (79.8)	15 (16.0)
21.	I am comfortable assisting or being assisted by a co-worker who has HIV.	48 (51.1)	41(43.6)
22.	I am comfortable sharing bathroom with a colleague who is infected with HIV.	43 (45.7)	48 (51.1)

## DISCUSSION

The mean age of the health care workers was  $39.8 \pm 8.0$  years and their mean duration of practices was  $14.0 \pm 8.2$  years. They have been practicing their profession for a long time. They had good knowledge of HIV transmission apart from 15% to 38% of them that felt that HIV could be transmitted through tears, saliva, vomit, feces and urine. These substances can contain HIV, but they do not contain the virus in amount significant enough to cause infection. To date, there is no documentation of HIV transmission through these substances<sup>28</sup>, even though the possibility cannot be ruled out.

Majority of the health care workers overestimated their risk of HIV infection, while over 22% did not know their actual risk level following exposure. This demonstrated poor knowledge of risk which had been documented as 0.3%, 0.1% and less than 0.1% for needlestick injury, mucous membrane and intact skin contact<sup>28</sup> respectively.

Processing of instruments immediately after use involves steps that ensure reduction in the risk of

transmitting infections from used instruments to HCWs and patients. The study however demonstrated that 78.7% of the HCWs did not know the correct steps as decontamination, cleaning, and sterilization or high level disinfection<sup>28</sup>.

For more than 100 years experts had shown that hand washing is the most important way to reduce the spread of infection in health care setting. However, hand washing is often under emphasized, not performed or not performed correctly in health care facilities. Hand washing and barrier precautions remain sub-optimal among all types of staff<sup>29</sup>. In this study the HCWs demonstrated poor compliance with hand washing before treating the patients.

Amongst the specific preventive recommendations made by World Health Organization and Center for Disease Control<sup>30-32</sup> is that gloves be worn by HCWs during all procedures where they may come into contact with patients blood and body fluids. The Nigerian Health Ministry in 1992<sup>33</sup>, also recommended that all personnel providing health care in the country should wear

gloves when contact with blood or other body fluid of any patient is anticipated. Hands are the most important instrument of most HCWs. They are also a principal vector for transfer of pathogens in health care settings<sup>34</sup>. Instances of sero-conversion have been documented following occupational exposure of skin of HCW to contaminated blood<sup>8,35</sup>. The hand hygiene report rate adherence in most studies had been found to be between 16% and 81%<sup>36</sup>. Most of the HCWs in this study wore gloves as appropriate. Only 49% made use of double gloving during surgical procedures. Double gloving is advocated, as a number of studies had shown lower perforation rate for the inner glove of double-gloved personnel compared with the one glove of single-gloved personnel or the outer glove of double-gloved personnel<sup>37-44</sup>.

The number one cause of occupational exposure to blood borne pathogens is by injury from hypodermic needle sticks or other sharp objects. Studies had documented injuries due to needle stick from recapping<sup>27,45-47</sup>. In this study some of the HCWs still recap needles and some detach needles from syringes. The manipulation of used needles and sharps before disposal predisposes the HCWs to nosocomial acquisition of blood-borne pathogens including HIV and hepatitis B and C viruses. Only 20.2% used "hands-free" technique for passing instruments and sharps during surgical procedures. The incidence of HIV amongst antenatal attendants is currently 5.4<sup>48</sup>% and health care workers could be at risk if infection prevention practices are not strictly adhered to.

There was poor compliance in wearing eye protection during surgical procedures. The non-availability may be partly responsible for this. All over the world the epidemics of HIV and AIDS are having a profound impact, bringing out the best and the worst in people. They trigger the best when individuals group together to combat the disease and offer care and support for people living with HIV and AIDS. They bring out the worst when HIV patients are stigmatized and discriminated against. This study has shown that many of the HCWs (44.7%) believed that HIV positive HCWs got infected at work. They therefore believed that HIV positive patients should be treated in a separate area to protect others. They also feel uncomfortable performing\* surgical procedures on such patients. They would avoid performing any task on the patients without wearing latex gloves. Studies had however shown that unprotected sexual intercourse and unsafe sexual practices carry a significantly higher risk of HIV transmission than accidental exposure to blood and body fluids in health care setting<sup>34</sup>.

In conclusion, this study had shown that the HCWs had good knowledge of HIV transmission. They however overestimated their risk of contacting infections. In spite of this there was poor compliance

to universal precautions. There was an element of stigmatization and discriminatory attitude towards people living with HIV and AIDS, which could have profound effect on the quality of services that would be provided to the patients. We recommend seminars/workshops for HCWs on universal precautions and stigma and discrimination reduction. The authority should provide needed materials that would protect the HCWs and the patients from getting infections from the facility. Finally we recommend the study to other institutions. The results can be utilized to bring about positive changes in infection prevention practices in the hospital setting and stigma and discrimination reduction towards people living with HIV and AIDS.

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