

KNOWLEDGE AND PRACTICE OF UNIVERSAL PRECAUTIONS AGAINST BLOOD BORNE PATHOGENS AMONGST HOUSE OFFICERS AND NURSES IN TERTIARY HEALTH INSTITUTIONS IN SOUTHEAST NIGERIA

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ABSTRACT

Purpose: To examine the knowledge and practice, as well as factors influencing universal precautions practices amongst Nigerian House officers and Nurses.

Methods: A Cross-sectional descriptive study. Sample selection was by stratified random sampling. Information was elicited using pretested, structured, self-administered questionnaire. Data were analyzed using EPI-info.

Results: Most Doctors, 66.6%, were aged 26-30 years while the Nurses, 41.1%, were aged 40 years. 57.6% of the Doctors were males, while 85.7% of the Nurses were females. Knowledge of universal precautions measures was high for both categories of respondents - 97.0% for doctors and 92.0% for nurses, although practice was better for the nurses, 75.0%, compared to the doctors, 15.2%, $p < 0.05$. The most important factor influencing universal precautions practice is the lack of provision of adequate protective equipments. Other factors, all of which show significant difference between the doctors and nurses ($p < 0.05$), include carelessness; lack of display of universal precautions guidelines; emergency nature of the procedure; insufficient water supply; patient perceived to be at low risk of blood borne pathogens; pressure of time; and universal precautions equipments interfering with technical skills.

Conclusions: Although knowledge of universal precautions is high for both house officers and nurses, practice is however better amongst the latter than the former. The effective knowledge and practice of universal precautions amongst hospital workers are of absolute necessity to prevent infections from blood and body fluid pathogens.

Key words: Nigeria; knowledge and practice; universal precautions; healthcare workers; tertiary health institutions.

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INTRODUCTION

Blood-borne pathogens constitute important occupational hazards to health workers, who may from time to time come into contact with the blood and body fluids of their patients. The emergence of Human immunodeficiency virus/Acquired immunodeficiency syndrome (HIV/AIDS) has further re-kindled interest on the awareness and study of the effect of blood and body fluid pathogens on health workers as a means towards preventing them, and mitigating their impacts¹. The local literature is scarce with information concerning observance of universal precautions against blood borne pathogens. Furthermore, it is not certain the prevalence rate of the various blood and body fluid pathogens including HIV, in our environment, resulting from the non-observance of universal precautions in work places. Evidence abounds,

however, in foreign literature as to the contraction of blood and body fluid pathogens amongst hospital workers from iatrogenic causes. For example, the World Health Organization (WHO) estimated in 1995 that unsafe injection accounted for 3.9% to 7.0% of new HIV/AIDS infection worldwide². A recent study has reported the global burden of blood borne infections from contaminated needles to include HIV, 5.4%; Hepatitis B Virus, 31.9%; and Hepatitis C Virus, 39.9%³. Furthermore, the proportion of infections and the total burden of diseases caused by unsafe injection practices annually have respectively been estimated by WHO as 32% and 21 million new cases for Hepatitis B; 40% and 2 million new cases for Hepatitis C; and 5% and 260,000 new cases for HIV/AIDS⁴. The global burden of indirect medical costs due to Hepatitis B, Hepatitis C, and HIV/AIDS per year has been estimated to be USD535million⁵. The risk of transmission of HIV and other blood borne infections is dependent upon the healthcare personnel practice, the prevalence of the

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illness especially among the patients, and the amount and frequency of exposure. This risk is greater in developing countries where occupational health programme is either non-existent or inadequate in most hospitals unlike in most industrialized countries where there are well-organized and purpose-built comprehensive occupational health services⁶. Health workers prone to infections with blood borne pathogens are nurses, laboratory technicians, surgeons, housekeepers, morgue technicians and non-nursing attendants⁷. House officers in particular are also often vulnerable to infection with blood-borne pathogens, being new comers to medical practice and having amongst others, to undertake the responsibility of venepunctures for the purpose of collecting blood sample for laboratory investigations, or administering intra-venous medications. Furthermore, House Officers have been identified to comply poorly with universal precautions practice and had given, among other reasons, not knowing about universal precautions protocol; forgetting the protocol; or not having time to implement the protocol, to be responsible for this poor compliance⁸. Universal precautions are simple infection control measures that reduce the risk of transmission of blood-borne pathogens through exposure to blood or body fluids among patients and healthcare workers. It has been defined by the Centres for Disease Control (CDC) as a set of precautions designed to prevent the transmission of HIV, HBV and other blood borne pathogens when providing healthcare⁹. This study has been undertaken amongst nurses and doctors in tertiary health institutions in southeastern Nigeria to determine their knowledge, practice, and factors influencing the practice of universal precautions against blood-borne pathogens. The information obtained will be necessary towards the development of appropriate institutional guidelines that may re-enforce any existing policy documents on universal precautions against blood and body fluid pathogens for health facilities.

SUBJECTS AND METHODS

This is a Cross-sectional descriptive study undertaken in 2004 on 178 House Officers and Nurses drawn from Nnamdi Azikiwe University Teaching Hospital, Nnewi, Anambra State, and University of Nigeria Teaching Hospital, Enugu, Enugu State, the two Federal Government Teaching Hospitals in the South-East geopolitical zone of Nigeria. They are centres for the Federal Government anti-retroviral trial therapy. HIV/AIDS clinics are run on daily basis in these centres and over 750 HIV/AIDS patients are seen weekly in each of these centres. The institutions serve as referral centres for most hospitals within and outside their states of location. Sample selection was by proportionate, stratified random sampling technique.

A total of 66 house officers and 112 nurses were selected from the two health institutions for the study following an informed consent. Pretested, close-ended, structured, and self administered questionnaires were used for the study. The questionnaire schedule elicited information in respect of the bio-social characteristics of the respondents - age, sex, and marital status; knowledge and practice of the four standard recommended universal precaution measures - hand washing, use of protective barriers, safe handling and disposal of sharps, and safe decontamination of instruments; as well as factors influencing universal precautions practice amongst the healthcare workers. Data analysis was done using EPI-Info software.

RESULTS

Majority of the Medical Doctors (House Officers), 66.6%, were aged 26-30 years, while the Nurses, 41.1%, were predominantly aged 40 years and above. Males constitute the majority of the house officers, 57.6%, while most of the nurses, 85.7%, were females. Amongst the respondents, 78.8% and 23.2% respectively of the doctors and nurses were single, while 65.1% and 21.2% of the former and latter were married. The divorced and widowed were found only among the nurses, comprising of 6.3% and 5.4% respectively. Both categories of respondents exhibit a high level of knowledge of universal precautions measures - 97.0% for doctors and 92.0% for nurses. However a significantly higher number of nurses, 75.0% claim to observe all universal precautions measures, compared to the doctors, only 15.2%, $p < 0.05$. Amongst respondents practicing any form of universal precautions measures, majority of the doctors, 50.0%, do that occasionally, unlike the nurses, where the majority, 66.1%, practice the measures always. The key factors commonly influencing the practice of universal precautions among the doctors and nurses, together with their levels of significance, include: lack of provisions of adequate protective equipments, doctors, 97.0% vs. nurses, 82.1% (not significant $p = 0.114$); carelessness, doctor, 87.9% vs. nurses, 48.2% (significant $p = 0.00034$); lack of display of universal precautions guidelines, doctors, 78.8% vs. nurses, 55.4% (significant $p = 0.0238$); emergency nature of the procedure, doctors, 78.8 vs. nurses, 44.6% (significant $p = 0.0005$); lack of sufficient water supply, doctors, 75.8% vs. nurses, 46.4% (significant $p = 0.011$). Other factors include: patient perceived to be at low risk for blood borne pathogens, doctors, 69.7% vs. nurses, 30.4% (significant $p = 0.00032$), pressure of time, doctors, 66.6% vs. nurses, 23.2% (significant $p = 0.00004$); universal precautions equipment interfere with technical skills, doctors, 36.4% vs. nurses, 10.7%, (significant $p = 0.002$); and patient not cooperative enough, doctors, 27.3% vs. nurses, 21.4% (not significant $p = 0.89006$).

Table 1: Distribution by Biosocial Characteristics of Respondents.

Characteristics	Doctors (N=66)		Nurses (N=112)	
	N	%	N	%
Age (Years):	21-25	10 (15.2)	4	(3.6)
	26-30	44 (66.6)	10	(8.9)
	31-35	10 (15.2)	18	(16.0)
	36-40	0 (0.0)	34	(30.4)
	>40	2 (3.0)	46	(41.1)
Sex:	Female	28 (42.4)	96	(85.7)
	Male	38 (57.6)	16	(14.3)
Marital Status:				
	Single	52 (78.8)	26	(23.2)
	Married	14 (21.2)	73	(65.1)
	Divorced	0 (0)	7	(6.3)
	Widow	0 (0)	6	(5.4)

Mean Age = 35.9 ± 9.4 Years.

Table 2: Distribution by Knowledge and Practice of Universal Precautions for Doctors and Nurses.

Characteristics	Doctors (N=66)		Nurses (N=112)	
	N	%	N	%
Knowledge of U-P:	Yes	64 (97.0)	103	(92.0)
	No	2 (3.0)	9	(8.0)
Observance of All Measures:				
	Yes	10 (15.2)	84	(75.0)
	No	51 (77.3)	25	(22.3)
	Don't Know	5 (7.5)	3	(2.7)
Frequency of Practice of U-P:				
	Always	22 (33.3)	74	(66.1)
	Occasionally	33 (50.0)	30	(26.8)
	Not At All	4 (6.1)	0	(0)
	Don't Know	4 (6.1)	0	(0)
	No Response	3 (4.5)	8	(7.1)

Key: U-P = Universal Precautions.

Table 3: Distribution by Factors Influencing U-P Practice amongst Health Workers.

Factors	Doctors (N=66)			Nurses (N=112)			X ²	P
	No	Yes	NR	No	Yes	NR		
	N ^o %	N ^o %	N ^o %	N ^o %	N ^o %	N ^o %		
A	12(18.2)	52(78.8)	2(3)	46(41.1)	62(55.4)	4(3.6)	5.2	0.02
B	2(3.0)	64(97.0)	0(0)	14(12.5)	92(82.1)	6(5.4)	2.5	0.11
C	8(12.1)	58(87.9)	0(0)	54(48.2)	54(48.2)	4(3.6)	12.8	0.00
D	18(27.3)	46(69.7)	2(3.0)	72(64.3)	34(30.4)	6(5.4)	12.9	0.00
E	40(60.6)	24(36.4)	2(3.0)	94(83.9)	12(10.7)	6(5.4)	8.9	0.00
F	22(33.3)	44(66.6)	0(0)	82(73.2)	26(23.2)	4(3.6)	16.5	0.00
G	14(21.2)	52(78.8)	0(0)	56(50.0)	50(44.6)	6(5.4)	7.9	0.00
H	48(72.7)	18(27.3)	0(0)	80(71.4)	24(21.4)	4(3.6)	0.02	0.89
I	16(24.2)	50(75.8)	0(0)	54(48.2)	52(46.4)	6(5.4)	6.3	0.01

Key to Table 3:

- NR. Non-Response
- A. Lack of display of universal precautions guidelines
- B. Lack of provisions of adequate protective equipments
- C. Carelessness
- D. Patient perceived to be at low risk for blood borne pathogens
- E. Universal precautions equipments interfere with technical skills
- F. Pressure of time
- G. Emergency nature of the procedure
- H. Patient not cooperative enough
- I. Lack of sufficient water supply

DISCUSSION

The relatively young age of medical doctors in this study, majority of whom are between 26-30 years old, is not surprising since these are House Officers just graduating from the Medical School. This is in contra-distinction to the ages of the nurses in the study, most of whom are 40 years. In a study on compliance with universal precautions in correlation healthcare facilities, Gershon et al observed that age was the only demographic variable associated with compliance to universal precautions measures. The study revealed that younger workers were more likely to be complaint with safe work practices than were older workers¹⁰. Although, this study has demonstrated a high level of knowledge of universal precautions against blood borne pathogens among both categories of respondents, the relatively younger medical doctors and the older nurses, there was however a significantly higher compliance to all forms of universal precautions measures amongst the nurses compared to the doctors. Whereas as high as 66.1% of the nurses practiced universal precautions always, only 33.3% of the doctors did. This finding is at variance with Gershon et al's observation of better practice of universal precautions amongst younger health workers, earlier alluded to¹⁰. In a study to investigate the factors associated with the practice of universal precautions amongst medical students, the females used universal precautions measures

more than the males¹¹. In a related study in Ile-Ife, Nigeria, on the awareness of basic principles of universal precautions, Bamigboye and Adesanya¹² observed a higher level of knowledge among nursing students, 77%, compared to medical students, 61%. The implication of these two latter studies is that sex and profession are important determinants to compliance with universal precautions among health workers, rather than age alone as a discrete variable. This may therefore explain the pattern in our study where compliance to universal precautions was better amongst the nurses, who are relatively older, compared to the medical doctors who are of younger age bracket. The relatively lower compliance to the observance of universal precautions by medical doctors as shown in this study is in conformity with the observation in various other studies. Sadoh et al¹³ and Stein et al¹⁴ have in their different reports corroborated the poor compliance of medical doctors to the observance of universal precautions measures against blood and body fluid pathogens. It is possible that this poor compliance to universal precautions practice may not be unconnected with poor practice habits developed over the years consequent upon absence of the inclusion of, and formal training on universal precautions in the medical education curriculum. In a recent study conducted amongst medical and nursing students in a Nigeria Teaching Hospital, only 36.9% of the medical students studied had a good knowledge of universal precautions. In addition, only 18.9% of the students claimed that universal precautions featured during their class room sessions, thereby highlighting the palpable exclusion of such important topics from the medical education curriculum¹². Apart from the absence of formal education on universal precautions for medical practitioners during the period of their training, majority of medical doctors have attributed their poor compliance to universal precautions to unavailability of personal protective equipments, and in some cases even basic necessity for infection prevention such as running water^{13, 15}. Nurses in this study have exhibited a significantly higher compliance to universal precautions practice compared to medical doctors. As high as 75% of the nurses studied claimed to observe all universal precautions measures in contra-distinction to only 15.2% of Doctors. This observation agrees with the finding in the study by Stein et al in Birmingham Teaching Hospitals where as high as 86% of the nurses treated each patient as though they were infected with blood borne pathogens, compared with 41% of the doctors. Reports from studies conducted even amongst students have demonstrated a better knowledge of the basic principles of universal precautions amongst student nurses compared to medical students and this may perhaps have been responsible for the generally better compliance to universal precautions practice observed amongst nurses compared to other health practitioners^{12, 16}. The factors affecting universal precautions practice in this study are similar between

the Medical Doctors and Nurses, although the level of influence of these factors differs between the two professional cadres. Apart from the “lack of provision of adequate protective equipments”, and “patients not cooperative enough”, which show no significant difference between the two professions, all the other seven factors show various levels of statistically significant difference between the medical doctors and nurses, exhibiting greater influence among the former than the latter. The most common factor influencing compliance to universal precautions practice amongst the two professional groups in this study is the lack of provision of protective equipments which was observed amongst as high as 97.0% and 82.1% of the Medical Doctors, and Nurses respectively. This observation is similar to that reported in previous studies, all of which have also recognized the shortage of provision of protective equipments to significantly influence compliance to universal precautions practices^{13, 15, 17}.

Amongst other factors observed in this study to affect compliance to universal precautions by our respondents include carelessness on the part of the health worker; lack of display of universal precautions guidelines; lack of sufficient water supply; patient perceived to be at low risk of blood borne pathogens; pressure of time; universal precautions equipments interfering with technical skills; and patients not being cooperative enough. In their study of variables influencing worker compliance with universal precautions in an emergency unit, Williams and co-workers¹⁸ correlated lack of time, patient being perceived to be at low risk of harbouring blood borne pathogens, and universal precautions equipment interfering with technical skills, to compliance to universal precautions practice, and this agrees with the finding in this study. Compliance to universal precautions was also strongly correlated with the perception of patient to be at low risk of transmission of blood borne pathogens by Gershon et al¹⁰, who in addition also identified poor knowledge of, and the lack of training on universal precautions amongst health workers to be major contributory factors.

CONCLUSIONS

The availability of standard safety precautionary packages in the workplace has the positive effect of motivating the workforce towards greater productivity. This study has highlighted the knowledge, and exposed the varying levels of compliance to, as well as the various factors affecting compliance to universal precautions practices against blood and body fluid pathogens amongst two very important segments of the health sector workforce- the Internist Medical Doctors and the Nurses. The number and variety of factors adduced by the respondents in this study to militate against the observance of universal precautions practice undoubtedly in one way or the other involve each of the three major stakeholders of any health institution, alike, viz management, staff, and clients. This implies therefore that a meaningful level of compliance to this very important safety practice can be achieved only

when all these stakeholders are effectively carried aboard to deal with these factors. Hospital management perhaps has a foremost part to play in this task. By far the most commonly identified factor influencing compliance to universal precautions practice is the lack of personal protective equipments. Hospital management should therefore ensure the regular and adequate supply of needed materials and equipments for effective universal precautions practices. In addition, the management of each hospital should facilitate the development of local guidelines to universal precautions including guidelines on post exposure prophylaxis, which should then be placed at strategic locations in the hospitals as a reminder to all hospital workers. Education and training of staff on universal precautions principles and practice would by providing the necessary knowledge on this important subject go a long way towards improving staff compliance to universal precautions practices. In particular, employment orientation courses should incorporate such educational and training programmes for the newly employed health workers. Hospitals should, furthermore, establish an Infection Control Committee, and an Infection Control Team to ensure the day-to-day monitoring, and surveillance of the availability of the necessary equipments for, as well as the proper compliance to, universal precautions practices against blood and body fluid pathogens by all hospital workers. The extent to which the other stakeholders key in to compliance with universal precautions practices is therefore invariably dependent on the leadership, commitment, and motivational drive of hospital management.

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