



Research Article

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Knowledge, Awareness and Prevalence of Viral hepatitis Among Health Care workers (HCWs) of the Federal Medical Centre Bida, Nigeria

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Abstract

Background: The health care workers (HCWs) hitherto are considered to be one of the vulnerable groups when compared to the general population due to the nature of their day-to-day workplace activities. However, in spite of the high seroprevalence level nationally, the level of awareness and knowledge about viral hepatitis amongst the general populace including the public health workers is non-uniform. **Aims and Objective:** To determine the knowledge, awareness and prevalence of viral hepatitis as well as to raise awareness among HCWs. **Study design:** cross sectional survey. **Setting:** Federal Medical Centre, Bida Niger State, Nigeria. **Materials and Methods:** A structured questionnaire was administered to Two Hundred and forty eight HCWs of the Federal Medical Centre, Bida. Blood samples were collected from individual participants and screened for Hepatitis B surface Antigen (HBsAg), Antibody to Hepatitis C Virus and Antibody to Hepatitis B core antigen using rapid ELIZA technique. **Statistics:** Data analysis was performed using SPSS version 20 software to obtain descriptive statistics for all participants with respect to demographic distribution, prevalence rate for HBV and HCV. Chi-square test was used to obtain relations between various categorical data. The statistical significance of the data was based on a p-value of ≤ 0.05 at the Yates' continuity correction line. **Results:** Of the two hundred and forty eight participants, 41.1% were males and 58.9% were females, M: F 1:1.4. The mean age was 33.7 (SD 6.9) years (range 20 - 54yrs). Occupational distribution was based on four main categories of health care workers; Doctors, Nurses, Allied health workers (AHWs) and Admin Staffs with frequency of 23(9.3%), 52(21.0%), 100(40.3%) and 73(29.4%) respectively. With regards to the educational level of the participants, 20(8.1%) were in the category of lower level education, 58 (23.4%) had middle level of education and 170(68.5%) were highly educated. The overall seroprevalence of hepatitis among the health care workers (HCWs) were as follows: HBsAg (11.3%), HCV (2.4%) and HBcore antibody (46.0%). Overall Awareness of the various types of hepatitis was 70.6% with a marked trend over educational levels. **Conclusion:** This study provided prevalence data, relevant information on the magnitude of disease burden and the significance of education on awareness of hepatitis B and C in this settings. There is paucity of awareness and knowledge among certain category of HCWs. Therefore concern Authorities should provide more HBV / HCV interventional information impact measures to raise awareness and knowledge among this group. Policies and guidelines of critical preventive protocol to ensure safety in a workplace environment including pre and post-exposure vaccination intervention for HBV to the staff should be in place.

Keywords: Viral hepatitis, Seroprevalence, Awareness, Knowledge, Exposure, Vaccination.

INTRODUCTION

Infections with hepatitis B virus (HBV) and hepatitis C viruses (HCV) are global public health problems which affect over 350 and 170 million people worldwide respectively, reaching endemic proportions in sub-Saharan Africa^[1-3]. Available data also show an estimated 57% cases of Liver cirrhosis and 78% cases of primary liver cell carcinoma as a result of HBV and HCV respectively^[4]. The global burden of disease due to acute hepatitis B and hepatitis C, cirrhosis of the liver and hepatocellular cancer is high and projected to become a higher ranked cause of death over the next two decades^[4].

Hepatitis B and C Viruses are recognized occupational risks, for Health Care Workers (HCWs)^[5]. Health Care Workers (HCW) are defined as persons (e.g employees, students, contractors, attending clinicians,

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public safety workers, or volunteers) whose activities involve contact with patients or with blood or body fluids from patients in health care, laboratory or public safety setting.^[3]

Throughout the world, millions of healthcare professionals work in Health Institutions and as such, an estimated 600,000 to 800,000 cuts and puncture injuries occur among health care providers per year, many of which (approximately 50%) are not registered.^[3,6]

Studies have shown that Health-Care personnel have a higher incidence of hepatitis and prevalence of viral hepatitis than those who have no occupational exposure to patients or blood products.^[7, 8]

Hepatitis B and C viruses can be transmitted by exposure to contaminated blood or infected body secretions.^[9] Transmission could also occur in the following situations such as percutaneous exposure (needle-sticks/ injection drug use; IDU) or body fluid contaminated with blood containing the virus, or invasive procedures such as phlebotomy, haemodialysis and surgery involving infected blood or instrument contaminated with these viruses.^[10, 11]

Intrinsic transmissibility of specific pathogens has been studied extensively. With respect to HBV, studies have demonstrated a risk for transmission associated with per-cutaneous exposure (needle sticks / IDU) to blood from HBV infected individual which ranged from 6% to 37% while the risk for transmission of HCV associated with such exposure has been estimated at 1% to 2%.^[12] Other mechanism associated with transmission of these viruses includes the frequency by which HCWs or Trainees sustained injuries. This could directly relate to both the experience of the HCW and expertise of the practitioner. It has been shown however, that Trainees are more likely to sustain such exposures.^[13,14,15]

Viral burden, measured in genomic equivalent per ml (GE/ml) of an infected individual is also a critical risk factor for percutaneous transmission but more discriminatory for HBV than HCV transmission.^[16] Overall, the underlying prevalence rate of HBV and HCV in the population, also contributes significantly to the increased risk of occupational exposure. In Nigeria, prevalence for HBV is in the range of 10% – 40% while for HCV, it ranges from 4.7% - 20%.^[17, 18]

Viral hepatitis infections particularly HBV, are preventable through standard protocol of vaccination and other prophylactic measures. Control and Post-exposure prophylaxis (PEP) for HBV is a well-established protocol for HCW and those at risk in a well-developed health setting.^[11]

The three strategies for managing HBV infections in the developed countries are comprehensive health education on blood borne pathogens and immunization for at risk population, antiviral drugs (Lamivudine, adefovir and dipivoxil) and immunostimulatory therapy with alpha-interferon.^[19]

According to 63rd World Health Assembly (WHA63.18), inadequate preventive and control measures, as well as lack of access to appropriate and affordable treatment, are responsible for the increased morbidity of viral hepatitis in developing countries such as sub-Saharan Africa.^[19] Therefore the commitment required to reduce the burden associated with viral hepatitis remains a big challenge among the stakeholders in the health industry.^[20] The World Health Organization (WHO) goal and strategy for global action for the prevention and control of viral Hepatitis, can be boosted by ascertaining the burden of these agents among the HCWs in the health institutions.^[21] As part of efforts to contribute to the growing data on the awareness, knowledge and prevalence of viral hepatitis among HCWs, this study was conducted to establish our own situation report in this hospital setting.

AIM AND OBJECTIVES

Aim: The study is to determine the knowledge, awareness and prevalence of viral hepatitis among health workers in line with the WHO working agenda for the prevention and control of viral hepatitis.

Objectives:

- To improve the knowledge among employees within the hospital community on viral hepatitis.
- To raise the awareness level among employees within the hospital community on occupational risk associated with viral hepatitis.
- To raise awareness on prevention and post exposure prophylaxis

MATERIALS AND METHODS

Settings: This study was carried out amongst employees of Federal Medical Centre, Bida, Niger State, Nigeria.

Study design: This research is a descriptive cross sectional survey.

Study period: The study was conducted for a period of four weeks. Ethical approval was obtained from the hospital ethical committee and study performed in accordance with the ethical standard laid down in the 1964 declaration of Helsinki

Participation in the study was voluntary and anonymous. Confidentiality of participants was maintained throughout the study period and there was no financial or material incentives for participation. Participants were educated on the essence of the study and format of the structured questionnaire which was self-administered. Prior to phlebotomy, informed consent was obtained from each individual participant as well as pre-test counselling.

Inclusion criteria:

Health Care Workers including trainees.

Exclusion criteria:

Those without proof of identification as employee or trainees

History of recent vaccination

Visitors

Sample Collection & Processing

Sample collection was carried at the phlebotomy unit of the hospital. After applying standard antiseptic technique, a total of 5.0 mls of venous blood sample was obtained from the ante-cubital vein of each participant and subsequently introduced into EDTA Vacutainer by the phlebotomist. Blood samples were transported to the designated haematology laboratory for further processing. Blood sample separation technique was undertaken using standard centrifugation methods at 2000g revolution per minute for 5 minutes. The supernatant plasma samples obtained were assayed for HBsAg, HCV and antibody to HBcore antigen in accordance with the manufacturers' standard operational procedure using the rapid hepatitis screening kits (ACON Laboratories, Inc. USA), and HCV kits (ACON Laboratories, Inc. USA).

Statistical Analysis

Data including demographic information and other relevant bio data were entered into the variable and data section of SPSS version 20 software.

Data analysis was performed using SPSS version 20 software to obtain descriptive statistics for all participants with respect to demographic distribution, prevalence rate for HBV and HCV. Chi-square test was used to obtain relations between various categorical data. The statistical significance of the data was based on a p-value of ≤ 0.05 at the Yates' continuity correction line.

RESULT

Socio-demographic characteristics

A total of 248 participants who met the inclusion criteria were recruited into the study,

102(41.1%) were males and 146(58.9%) were females, M: F = 1:1.4. The age range between 20 and 54yrs with the mean age of 33.7 (SD6.9) years. Occupational distribution was based on four main categories of health care workers; Doctors, Nurses, Allied health workers (AHWs) and Admin Staffs with frequency of 23(9.3%), 52(21.0%), 100(40.3%) and 73(29.4%) respectively Fig. 1. With regards to the educational level of the participants, 20(8.1%) were in the category of lower level education, 58(23.4%) had middle level of education and 170(68.5%) were highly educated. Fig 2.

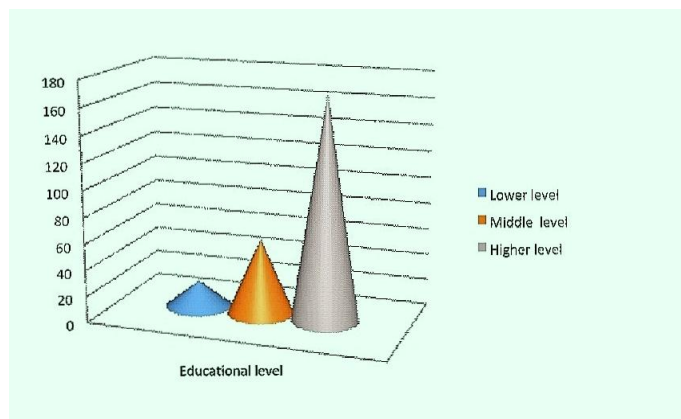


Figure 2: Educational level of HCWs

Seroprevalence of Hepatitis among the HCWs

The overall seroprevalence of hepatitis among the health care workers (HCWs) are as follows: HBsAg 28 (11.3%), HCV 6 (2.4%) and HBcore antibody 114(46.0%) [Table 1].

Percentage prevalence of HBsAg based on occupation status are as follows: Doctors 3(13%), Nurses 6(11.5%), AHWs 12(12%) and Admin staffs 7(9.5%) [Table 2]. Similarly, in the case of HCV, 0(0%), 1(1.9%), 2(2.0%) and 3(4.1%) were recorded for the Doctors, Nurses, AHWs and Admin staffs respectively [Table 2].

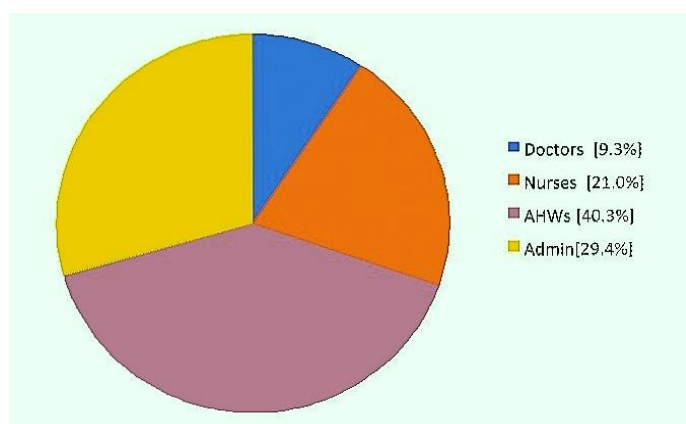


Figure 1: Occupational distribution

Table 1: Overall Hepatitis Seroprevalence among HCW

	HBsAg		HCV		HBcore	
	No	%	No	%	No	%
Reactive	28	11.3	6	2.4	114	46.0
Non-Reactive	220	88.7	242	97.6	134	54.0
Total	248	100.0	248	100.0	248	100.0

Table 2: Seroprevalence of Hepatitis among HCWs

S/no	Occupation	HBsAg		HCV	
		Reactive	Non-Reactive	Reactive	Non-Reactive
		No (%)	No	No (%)	No
1	Doctors	3 (13.0)	20	0 (0.0)	23
2	Nurses	6 (11.5)	46	1 (1.9)	51
3	AHWs	12(12.0)	88	2 (2.0)	98
4	Admin	7 (9.5)	66	3 (4.9)	70
	Total	28	220	6	242

Awareness level of Hepatitis among HCWs

Of the 248 subjects, 175(70.6%) were aware of the various types of hepatitis. Among the aware group, 18(10.3%) were reactive for HBsAg, while in the unaware group, 10(13.7%) were reactive for HBsAg. Similarly 5(2.9%) of those that were aware of HCV were reactive. Among the unaware group for HCV, only 1(1.4%) person was reactive for HCV.

In the case of HBcore, 45.7% of those aware were reactive while 80(46.6%) of those unaware of HBcore were reactive. There is no significant association between awareness and HBsAg, HCV or HBcore antibody status (p -values =0.580, 0.809 and 1.000 respectively).

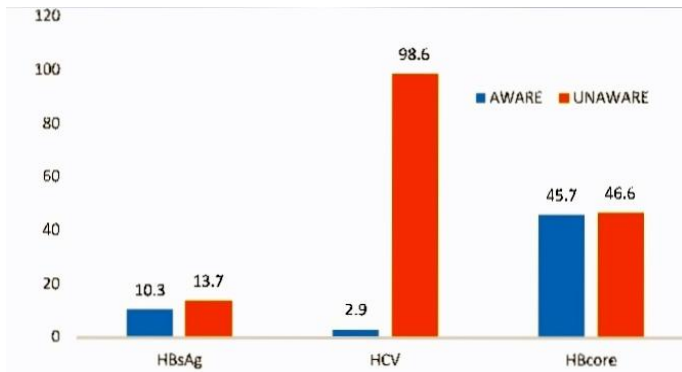


Figure 3: Percentage reactivity and awareness

Awareness level

The level of awareness in relation to occupational distribution and educational level, is depicted in fig 4 and 5 respectively. Twenty three (100%) of the doctors had a prior knowledge on hepatitis and as well as their various mode of transmission. Fifty one (98.1%) of the nurses, 55 (55%) of the AHWs and 46(63%) of the administrative staffs were also aware of hepatitis. The association between occupation and level of awareness was statistically significant (p -value=0.001).

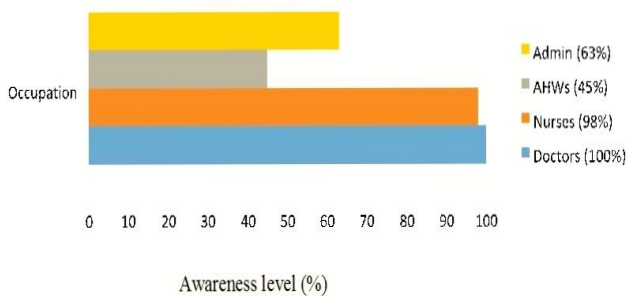


Figure 4: Awareness level of various occupation

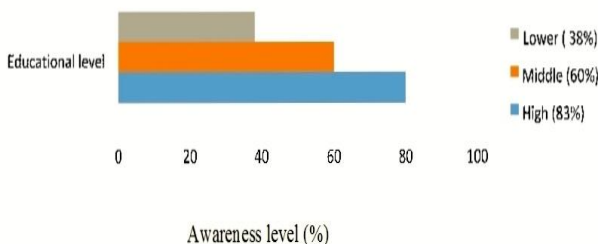


Figure 5: Awareness based on educational level

Twelve (60%) of the lower level education, 22 (37.9%) of the middle level education and 141(82.9%) of the higher level education were aware of hepatitis. There is a statistically significant association between educational level and awareness of hepatitis (p -value=0.001).

Risk factors:

Patient handling and Hepatitis

One hundred and five (42.3%) of HCWs were involved in patient handling while 143(57.5%) of the HCWs did not at any time have contact with patients or patient's blood or body fluids. Thirteen (12.4%) of the subjects involved in patients handling were reactive for HBsAg. Amongst those who were not involved in patients handling, 15(10.5%) were reactive. The association between patients handling and HBsAg positivity was not statistically significant (p -value=0.793).

In the case of patients handling and HCV, 2 (1.9%) of the HCWs were reactive. 4 (2.8%) of those not involved in patient handling were reactive. There is no statistical significance between patients handling and HCV (p -value=0.973).

Similarly, 49 (46.7%) of HCWs involved in patients handling were reactive for HBcore antibody while 65 (45%) of those not directly involved in patients handling were reactive for HBcore antibody. The association between patients handling and the presence or absence of HBcore antibody was not statistically significant (p -value =0.952).

Blood transfusion and hepatitis

Among the HCWs, 29 (11.7%) had blood transfusion exposure while 219 (88.3%) had no history of blood transfusion. Of the 11.7% with a history of blood transfusion exposure, 3 (10.3%), 3 (10.3%) and 19 (65.5%) were reactive for HBsAg, HCV, and HBcore antibody respectively. The association between blood transfusion and HBsAg reactivity was not statistically significant (p -value =1.000), however, in the category of blood transfusion and HCV or HBcore antibody positivity, the association was statistically significant with P -value = 0.021 and 0.040 respectively

Injection Drug Use (IDU) and Hepatitis Status

Twenty one (8.5%) of the subjects had a history of IDU while 227 (91.5%) recorded no history of IDU. Among the population of IDU, (2)9.5%, 1(4.8%) and 7(33.3%) were reactive for HBsAg, HCV and HBcore antibody respectively. The association of IDU with hepatitis status was not statistically significant (p -value=1.000, 1.000, 0.324 respectively).

DISCUSSION

The periodic study or survey of the populace for prevalence, knowledge and awareness of viral hepatitis is vital to reducing the burden of this disease and its complication from our society. Viral hepatitis is associated with high mortality and morbidity^[22] and therefore, remains a concern to all especially in the developing countries where our inadequate health facility still struggles with basic medical diagnosis but emphasizes more on treatment of disease conditions rather than preventive medicine.

In addition to mandatory vaccination against HBsAg to the new-born as a means of combating the scourge of HBV, public enlightenment of and or health promotion amongst the populace especially adults at risk, remains the fundamental principle in the prevention and reducing the burden of diseases such as viral hepatitis^[23].

Viral hepatitis has no preference for personal status or class discrimination as depicted in this study. As long as such individual is

exposed to known risk factors or procedures, transmission of viral hepatitis will continue unhindered.

The health care worker is considered to be one of the vulnerable groups when compared to the general population by the nature of their day-to-day workplace activities^[22]. They are constantly involved with procedures such as phlebotomy, setting of intravenous lines, administration of intravenous drugs, performing minor or major procedures on body tissues and organs, aspiration of body fluids etc. all of which are veritable means of acquiring and transmitting viral hepatitis according various studies^[23,24, 25, 26, 27].

The overall seroprevalence of Hepatitis B surface Antigen (HBsAg) and Antibody to Hepatitis C (Anti - HCV) among HCWs in this study is 11.3% and 2.4% respectively. The seroprevalence of HBsAg and HCV amongst the different category of HCWs is evenly distributed although slightly higher figures in HBsAg were obtained amongst Doctors (13.0%), Nurses (11.5%) and Allied workers (12.0%).

The seroprevalence figure obtained for HBsAg in this study is not at variance with the National prevalence figure of 10% - 40% or prevalence figures obtained from other similar studies done amongst health workers in Kano state (13.6%)^[28] and Uyo, Akwalbom State (17%)^[29]. In the same vein, some other tertiary health institution such Lagos (1.5%) and Ado Ekiti (4.3%) had recorded a lower prevalence rate in previous studies. Also in this study, there is a slight reduction in the seroprevalence obtained for HCV when compare to 4.7% - 20% of the National prevalence.^[17, 18]

In spite of this high seroprevalence level recorded in this study and nationally, the level of awareness and knowledge about viral hepatitis especially among lower level educated personnel remain worrisome. This study shows a high level of knowledge and awareness base of viral hepatitis among Doctors (100%) and Nurses (98%), however, quite a reasonable number of other health personnel namely Allied health workers (55%) and the Administrative staff (37%) are not aware or do not have any knowledge of viral hepatitis and its mode of transmission. This findings agree with several previous studies conducted in similar settings such as 86.3% awareness level in UsmanuDanfodiyo University Teaching Hospital, Sokoto State Nigeria^[30,31,32,33 34] and 73.7-99.3% in Calabia Hospital India. However, Adekanle et al reported a lower level (33%) of awareness among the staff of the Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria.^[35]

As stated above, information and knowledge of any disease condition is pertinent to disease prevention but sometimes, this may not translate to disease prevention if such knowledge is not properly internalized and put to practice in all aspect of human's health endeavours. Therefore, apart from putting health aids materials in place and in strategic location in a hospital, health care workers' antecedent must be scrutinized and made to adhere to and understand work place operational guidance especially when handling high risk procedures.

In this study, 42% of the participants were involved in handling patients, 11.7% had history of exposure to blood through transfusion and other related procedures and 8.5% were engaged in the use of drugs injections or administration. These are some of the risk factors that can sustained the transmissibility of viral hepatitis especially in a hospital settings. The high rate of exposure amongst participants to blood could possibly account for the high prevalence of HBcore antibody obtained in this study.

Most hospitals especially the primary health centres do not have in place core health care plan for staff. At the point of engagement of new employee, request for medical test which is one of the criteria for employment or enrolment are not properly scrutinized as per the

source of such test results and more often than not, does not include viral hepatitis screening. Although reactivity for viral hepatitis screening is not meant for discriminatory purposes or to stigmatize prospective employee, it is to enable the health authority activate measures aimed at preventing or discouraging the propagation of such transmission between employees or health care workers and patients.

Hospitals in the developing world should be properly equipped with protective gadgets in form of protective overall, protective glasses, hand gloves, constant supply of water and electricity as well as disinfectants. These ought to be rudimentary when setting up a hospital and should be encouraged and re-instituted in all primary health centres, government hospitals and private medical centres alike. In the same vein, all hospitals should create, if not already in place, a unit, saddled with the responsibility of acquiring and managing vaccines. HBV vaccines should be readily available in such units to cater for those who have not been exposed to the virus or exposed through occupational hazard.^[31] This will no doubt take care of pre and post exposure vaccination against viral hepatitis.

Limitation of the study

The seroprevalence of antibody to Hepatitis B Core antigen in this study is 46% depicting a high level of exposure. Probably, the prevalence figure of 11.3% obtained in this study could have been higher, but the effect of HBcore results on the overall prevalence cannot be ascertained due to the combined nature of IgG & IgM in HBcore Kit employed in this study as well as not assaying for antibody to Hepatitis B surface antigen.

The use of rapid screening kits might have undermine the actual prevalence figures obtained in this study. Future studies should employ the use of Eliza techniques and or Nucleic acid methods.

Recommendations

Seroprevalence of viral hepatitis in this study and other studies remains high. Studies including the current paper also show that the level of awareness about viral hepatitis among certain cadre of personnel is still poor. Therefore the following should be in place as a matter of policy.

- Health education and promotion should be introduced in the school curriculum at all levels.
- Information dissemination through various electronic and social media about the scourge of viral hepatitis, mode of transmission and prevention should be encouraged.
- Adequate Screening for viral hepatitis and Hepatitis B virus vaccination should be administered routinely to children and adults as well as the vulnerable, especially the Health care workers
- Protective health gadgets and infection control measures should be the corner stone of all health centres.
- Enabling legislation should be enacted to maximize adherence to the above health promotion measures.

CONCLUSION

This study provided prevalence data, relevant information on the magnitude of disease burden as well as the significance of education on awareness of hepatitis B and C in this settings. There is paucity of awareness and knowledge among certain category of HCWs. Therefore it is hoped that concerned Authorities provide more HBV / HCV interventional information impact measures to raise awareness and knowledge among this group. Also policies and guidelines of critical preventive protocol to ensure safety in a workplace environment including pre and post-exposure vaccination intervention for HBV to the staff should be in place.

Conflict of Interest

Authors have declared that no competing conflict interest exist.

Authors Contribution

Dr CE Amiwero: wrote the paper substantially as well as organising the events leading to data collections and analysis.

Dr EA Nelson: Made substantial contribution at the analysis stage and to the literature review of this paper.

Dr. OF Olaosebikan: was involved in the entire process of sample collection and data capturing

Dr. M Yusuf: was involved in the entire process of sample collection and data capturing

Dr. MAN Adeboye: was involved in the entire process of sample collection and data capturing

Dr. A. Adamu: was involved in the entire process of sample collection and data capturing

Dr. JS Busuyi: was involved in the entire process of sample collection and data capturing

Dr. C. Oladela: was involved in the entire process of sample collection and data capturing

Dr. SA. Erinle: was involved in the entire process of sample collection and data capturing

Dr. A Babalola: was involved in the entire process of sample collection and data capturing.

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