



COMPARATIVE ANALYSIS OF BLOOD DONATION PRACTICES AMONG STUDENTS AT NIGERIAN UNIVERSITY

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ABSTRACT

There is a huge deficit in the proportion of voluntary non-remunerated blood donors (VNRD) in Nigeria as most of the donations are from paid donors. Young adults, most especially students from higher institutions, constitute the majority of blood donors worldwide. The aim of this study, therefore, is to determine the factors that are associated with blood donation between the students from the main campus and the college of medicine (COM) campus of a Nigerian University. This was a cross-sectional analytical study conducted among VNRD at the main and COM campuses of a Nigerian University. Pre-donation questionnaires were used to obtain data from the students. Data were analyzed using the statistical package for social science (SPSS) IBM version 25. All tests were two-sided, and statistical significance was considered to be at a probability value of $p < 0.05$. A total of 203 students showed up for VNRD on the two campuses on two separate days. About 59% were from the COM campus, and the mean age of the donors was 22.2 (2.4) years. There was no significant difference in the mean age, gender distribution, haemoglobin concentration, and eligibility to donate between the two groups of donors. Only two donors tested positive for HCV and HBV and both were from the COM. This study did not find any difference in the factors that influence the pattern of voluntary blood donation between two groups of university students who study medical-related courses and those that are not.

Keywords: Blood donation, College of medicine campus, Main campus, Practices, University students

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INTRODUCTION

The abysmal low blood donation rate in Nigeria remains a major challenge to the blood transfusion service. World Health Organization report showed that the blood donation rate per 1000 people in a low-income country is 5.0 donations compared to 31.5 donations in high-income countries(World Health Organization report 2020). This is a far cry from the minimum of one percent recommended to meet the blood needed by a nation. Eighty-four percent of the world's population resides in developing nations and of the global collection of 118.5 million blood units yearly, only about 60% are from these developing nations with increasing populations (World Health Organization report 2020) Blood donation in Nigeria is largely from both the paid donors and replacement donors by families and friends (National Blood Transfusion Service. The National policy 2006). This is because voluntary donation is very low and are estimated to constitute only about 5% of total donation in Nigeria (Ugwu et al ., 2018; Ugwu *et al.*, 2019; Ossai et al 2018).

The knowledge of blood donation has been consistently shown to be an important factor that determines blood donation practices across different populations. A study across different faculties of discipline among undergraduate university students in Nigeria showed that students from the college of medicine had significantly better knowledge and higher donation rate compared with other students from humanities, law, sciences, and engineering (Ogundeji *et al.*, 2021) and this was similar to the finding of Gebresilase *et al.*, (2017) and Nwabueze *et al.*, (2014). However, Nwogoh *et al.*, (2013) in Benin found a disparity between knowledge, attitude, and actual donation practice among health workers (9). Other workers have identified altruism, donation for family members, and incentives as motivation factors for blood donation (Ossai *et al.*, 2018; Asamoah *et al.*, 2017; Adewuyi and Olawumi, 2006). Outside Nigeria in Africa, Musa and Shaaban, (2019) in Sudan did not find any significant difference in blood donation patterns between medical and pharmacist students.

It is postulated that there is no difference in the demography and pattern of blood donation between students who are not from the COM who reside in the main campus and those from the COM who reside in the hall of residence annexed to a teaching hospital in a Nigerian University. The aim of this study, therefore, is to determine the factors that influence the pattern of voluntary blood donation among university students.

MATERIALS AND METHODS

STUDY DESIGN AND SETTING

The influence of affiliation with medical school on voluntary donation was analyzed using a cross-sectional study design. VNRD at the main campus and annex campus housing the medical and paramedical students of a Nigerian University during a 2-day blood drive at each of the campuses in April 2022. This survey was carried out to identify if studying medical-related courses influences donation.

The University of Ibadan was established in 1948 as the first university in the country, located in Ibadan. The main campus is located at the Agbowo end of Ibadan while the annex campus is located at the Oritamefa Area of Ibadan. The total number of students in the university currently stands at 41 743.

STUDY POPULATION AND SAMPLE SIZE.

All students who presented for the scheduled voluntary blood donation drives at the main campus and annex campus of residence of COM and who consented constituted the study population.

ETHICAL CONSIDERATION

Approval was obtained from the Southwest Zonal Centre of the National Blood Service Commission. Informed consent was obtained from all the participants. The study participants were informed about the purpose of the study and they were assured of the confidentiality of the data obtained which were stored in a password-protected computer that was only accessible to the researchers.

DATA COLLECTION

The students were informed of the blood donor drive through a campaign rally conducted at the students union government building located at the main campus and the hall of residence at the COM campus. Pre-donation interviewer-administered standard questionnaires for blood donors were used to obtain data. The questionnaire comprised three sections, first on sociodemographic (age and gender) donation history and recent activities that can cause deferral. The pre-donation screening was done for each potential donor, this screening includes Weight, Haemoglobin, Blood pressure, and Pulse rate. For donors that were fit to donate, 450mls of blood was withdrawn into a new blood bag. Samples for blood group and Transfusion Transmissible Infection (TTI) screening were also taken.

DATA ANALYSIS

Data were analyzed using the statistical package for social science (SPSS) IBM version 25. Continuous variables (age, weight, and haemoglobin) were normally distributed (Kolmogorow-Sminow test of normality) and were summarized as means and standard deviation, and bivariate analysis was performed using the Independent sample *t*-test. Categorical variables were summarized as percentages and multivariable analysis was either by Pearson Chi-square Fisher's Exact Test where applicable. All tests were two-sided, and statistical significance was considered to be at a probability value of $p < 0.05$.

RESULT AND DISCUSSION

A total of 203 students showed up for donation with a mean age of 22.2 (2.4) years (range: 18-34). There were more males than females with M:F of 1.2:1. This index study showed that the majority of the voluntary blood donors were males, although more females donated at the main campus. Globally, males predominantly donate blood, this is because of the physiological changes that are seen in women, these include the monthly menstrual flow, pregnancy, and breastfeeding. This finding is consistent with the WHO report (2011) where more than 75% of the donors were men. The finding of slightly increased female donation at the main campus is a reflection that the orientation about blood donation is changing. This is as previously reported in a study done by Dalmiro Prados Madrora *et al.* (2010) where more females donated. There is a need for increased awareness and education about blood donation in women. Women are more altruistic than men as men are individualistic (Bani and Guissani, 2010) Also it is now known that

if women are involved, there is a likelihood of involving the whole family. Also, women now understood better the effectiveness of a blood bank because of possible transfusion demands during pregnancy and the childbearing stage.

The mean weight of the respondents was 66.0 (10.3) kg with a majority (68.0%) weighing between 57 and 76kg. The mean haemoglobin concentration of all the respondents was 14.2 (1.5) g/dl. About 82% of the respondents were eligible to donate. About half of the respondents (47.6%) are O Rh D positive while one quarter each were A Rh D positive and B Rh D positive (Table 1).

Table 1: Demographic characteristics and blood donor parameters of all the participants

Variable	Frequency	Percentage (%)
Gender(N=203)		
Male	109	53.7
Female	94	46.3
Weight (kg) (n=203)		
<56	37	18.2
57-66	71	35.0
67-76	67	33.0
>77	28	13.8
Mean \pm sd	66.0 \pm 10.3	
Age(years) (n=203)		
<21	29	14.3
21-22	80	39.4
23-24	57	28.1
>24	37	18.2
Mean \pm sd	22.2 \pm 2.4	
Haemoglobin(g/dl)(n=197)		
<12.5	28	13.8
12.5-16.0	146	74.1
>16.0	23	11.7
Eligibility do donate(n=203)		
Yes	166	81.8
No	37	18.2
Blood group of donors (n=166)		
A Rh D POS	38	22.9
AB Rh D POS	7	4.2
B Rh D POS	38	22.9
O Rh D POS	79	47.6
O Rh D NEG	4	2.4

One hundred and twenty (59.1%) were from the COM annex campus of the university. The proportion of male donors in the COM was significantly higher than those from the main campus (70.0 % vs 48.5%, $p=0.005$). There was no significant difference in the mean age and weight of the donors from both the COM and main campus of the university [22.9 (1.9) and 22.3 (2.9), $p=0.106$] and [68.0 (9.4) and 65.3 (11.3) $p=0.097$] respectively. The majority of the donation was done by students less than 21 years and this finding is in keeping with the WHO report where most donors are within 18 to 24 years. Most of the donors in the study done by Olawumi and Adewuyi (2012) showed that most voluntary donors were between 20-29years. This is against a previous study done by Fasola *et al.* (2008) where the age range of the highest donor was 25-34years, this is because most of the donors in her study were replacement donors. Young adults have been reported to be the backbone of blood donation in Nigeria and if this could be sustained,

voluntary non-remunerated blood donation will completely replace both the family replacement and paid donors. There was also no difference in the eligibility to donate between the two campuses. More than three-quarters of the participants were eligible, this is because they are young and the age range constitutes the major pool for voluntary blood donation worldwide. This is consistent with previous studies done by Nwogoh et al 2012. there was no difference in those that had donated before between the two campuses despite one of the campuses housing the teaching hospital for medical training. This shows that knowledge about voluntary blood donation does not translate to actual blood donation. This is consistent with Salawu and Odeh. (2011) where knowledge about blood donation was high and blood donation was found to be low in the same group of students

Also, there was no significant difference in the mean haemoglobin concentration between the two groups 14.7 (1.4) vs 14.5 (1.4) g/dl, $p=0.33$ and eligibility to donate (83.5% vs 79.5%, $p=0.489$). Only 2 donors had donated more than 2 times on the main campus, and they had donated 5 and 6 times. However, in the COM, 5 donors had donated more than 2 times in the past: 3 had donated 5 times while 2 had donated 7 times (Table 2).

Table2: Comparison of the demographic and donor parameters from both the college of medicine and the university's main campus. (N=166)

Variable	College of Medicine Campus (n=100) Frequency (%)	Main University Campus (n=66) Frequency (%)	Test statistic	p-value
Gender				
Male	70(70.0)	32(48.5)	6.02	0.005 ^a
Female	30(30.0)	34(51.5)		
Age(yrs)				
<21	10(10.0)	17(25.8)	15.7	0.001
21-22	32(32.0)	30(45.5)		
23-24	36(36.0)	10(15.2)		
>24	22(22.0)	9(13.6)		
Mean ± sd	22.9±2.0	22.2±2.7	1.9	0.06
Weight (Kg)				
<56	8 (8.0)	18 (27.3)	11.6	0.009
57-66	41 (41.0)	19 (28.8)		
67-76	35 (35.0)	19 (28.8)		
>77	16 (16.0)	10 (15.2)		
Mean ±sd	68.0 ±9.4	65.3.±11.3	1.7	0.097 ^{b**}
Haemoglobin (g/dL)				
Mean ±sd	14.7 ± 1.4	14.5±1.4	0.6	0.33 ^b
Eligibility to donate				
Yes	100(83.5)	66(79.5)	4.79	0.489 ^a
No	20 (16.7)	17(20.5)		
Previous donation				
None	70(70.0)	51(77.3)	5.6	0.468 ^a
1-3	25(25.0)	13(19.7)		
≥4	5(5.0)	2(3.0)		

^aChi-square ^bIndependent t-test ** $p < 0.05$

Screening for transfusion transmissible infections (TTI) among the donors revealed one participant tested positive for human immunodeficiency virus (HIV) and syphilis and two tested positive for hepatitis B and C viruses in the college of medicine campus while only one participant tested positive for HIV (Table 3). There was no significant difference in the rate of seropositivity to transfusion transmissible infections in the two study populations. However, the only two donors who tested positive for hepatitis B and C were students from the college of medicine campus with a seroprevalence rate of 1.7% respectively. This seroprevalence rate of Hepatitis B is lower than 2.8% in Voluntary non-remunerated donors reported by Ogbenna et al 2021 in Lagos, Nigeria (20), this is also lower than the National prevalence rate of 2.0% to 9.8% among blood donors. The seroprevalence rate of the Hepatitis C virus is higher than the 1.07% reported by Ogbenna AA et al 2021. The positive seroprevalence rates of Hepatitis B and C in the College of Medicine cohort could be a result of procedures done by the students in the health-related faculties. We opined that pre-clinical immunization against hepatitis B and training on infection control practices should be mandatory for clinical students.

Table 3: Transfusion transmissible infections in the participants (n=166)

Variable	College of medicine Campus Freq(%) n=100	Main Campus Freq (%) n=66	Fisher's Exact	P value
HIV				
Pos	1 (1.0)	1(1.5)	2.8	0.418
Neg	99 (99.0)	65(98.5)		
Syphilis				
Pos	1 (1.0)	0 (0)	1.3	0.513
Neg	99(99.0)	66(100)		
HBV				
Pos	2(2.0)	0 (0)	2.0	0.365
Neg	118(98.0)	66(100)		
HCV				
Pos	2(2.0)	0 (0)	2.0	0.569
Neg	98(98.0)	66(100)		

Regarding the reason for the deferral of prospective donors, 17 donors were deferred in the COM because of low haemoglobin, while one donor was deferred for high blood pressure of 150/80mmHg. In the main Campus, 10 donors were deferred due to low haemoglobin, one donor for high blood pressure (mmHg150/100), and 3 persons due to body weight less than 50kg. Five of the participants were deferred for other reasons. The main reason for deferral in our donors was low haemoglobin levels on both campuses, potential donors with haemoglobin levels below the cut-off point were not allowed to donate. This finding agrees with previous studies done by Kanika *et al.* (2015) and Okoroikwu and Asemota, (2019). Almost all the deferrals were temporary and can be easily attended to by the potential donors as counseling and further referral was made at the point of donation. If all the causes of deferral can be addressed and attended to on time, the deferred can subsequently be added to the pool of voluntary donors. The limitation of this study is the small sample size from each cohort.

CONCLUSION

This study did not show any difference in the blood donation practice and other related factors in the two campuses. However, students from the college of medicine are more likely to contract transfusion-transmissible infections because of their courses of study and interactions with patients. Therefore there is a need to intensify immunization and training protocols to protect them.

CONFLICT OF INTEREST

There is no conflict of interest in the conduct and reporting of this research.

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