Research Square

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Blood Donation Knowledge Levels, Behaviours and Barriers among the Colleges of Health Sciences and Pharmacy Students of a Private University in Nigeria

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Research Article

Keywords: barriers, blood donation, knowledge levels, Nigeria, private university student

Posted Date: May 25th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9280475/v1

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Additional Declarations: No competing interests reported.

Version of Record: A version of this preprint was published at Discover Public Health on October 12th, 2026. See the published version at https://doi.org/10.1186/s12982-026-02757-6.

Abstract

Background

Inadequate safe blood donation is a major public health problem in Nigeria. A stable base of regular, voluntary, unpaid low risk blood donors would assure a continuous and reliable supply of adequate safe blood and blood products for transfusion services in Nigeria and Sub-Saharan Africa at large.

Objectives

To assess the knowledge levels and behaviours about blood donation among students. To also identify the barriers that contributes to the unwillingness to donate blood among students of the College of Health Sciences in a Nigerian private university

Participants and Methods:

This was a questionnaire based descriptive cross-sectional survey among students of the College of Health Sciences and Pharmacy in a private tertiary institution in Nigeria. The socio demographic status, knowledge levels, behaviours, and barriers to blood donation among respondents were captured. Obtained data was analysed using IBM SPSS Statistics version 25.

Results

Six hundred and fifty questionnaires were shared with a response rate of 96.6%. Ninety-six-point five (96.5%) of the respondents were aware that blood donation saves life. Less than half of respondents 289(46%) agreed that the ideal source of blood donation should be human voluntary. One hundred and fifty-five (28.2%) of the respondents ever donated blood of which seventy-six (49%) was voluntary. The majority of the respondents 514 (81.9%) claimed they did not have adequate information about blood donation. This was identified as a major barrier to their not showing interest in blood donation. Some of the respondents 48(2.7%) were afraid of contracting HIV and hepatitis viruses through blood donation.

Conclusion

Knowledge of blood donation was inadequate. There was a low practice of blood donation among the studied population. The major barrier to blood donation among studied students was lack of adequate information

Introduction

Blood donation is a vital life-saving and health improving service to any community. Inadequate blood donation and non-availability of adequate safe blood supply in the sub-Saharan Africa including Nigeria is a major public health problem(1). An ideal substitute for human blood is yet to be found, hence blood donation is still the only viable option for persons with different medical conditions that require blood transfusion(2). An adequate and reliable supply of safe blood can be assured by a stable base of regular, voluntary, unpaid blood donors.These are the safest group with the lowest prevalence of blood-borne infections.(3).The supply of safe blood has been inadequate despite a progressive increase in demand in Africa which has contributed to child and maternal mortality especially in African countries. Globally, about 250,000 maternal deaths and close to 15% of child mortality in Africa are reportedly due to obstetric haemorrhages and

anaemia respectively (4).Many preventable deaths occur in Africa because there are insufficient blood donations to meet patients' needs as those requiring transfusion do not have timely access to safe blood (1).The whole blood donation rate is an indicator for the general availability of blood in a country. WHO reported the median blood donation rate in high income countries as 31.5 donations per 1000 and five (5) donations per1000 people in low-income countries like Nigeria (5).The World Health Organisation recommends 100% voluntary blood donation which is the foundation of a safe and sufficient blood supply (6). Categories of blood donors are usually volunteer, replacement, and paid/commercial (6). A previous study in Nigeria found that less than 20% of the total blood donors studied were voluntary non remunerated (7).The voluntary unpaid blood donors are the safest source of blood supply because the prevalence of blood borne infections is lowest among them. A voluntary blood donor is expected to be a healthy individual who donates his or her blood as a medical treatment for other people without expecting any remuneration (5).Replacement donations remain the predominant type in Sub Saharan Africa. Most developing countries like Nigeria are struggling to achieve 100% voluntary non remunerated blood donations which has been the recommendation by WHO. The struggle is as a result of the many existing social, demographic, cultural and economic problems. The blood donation process is defined as a medical procedure that involves transferring blood from a healthy, voluntary person to someone who needs blood. Blood donations could be: red cells, platelets, plasma by aphaeresis and whole blood (8). WHO has suggested for countries to focus on young people to be able to achieve 100% non-remunerated voluntary blood donations (9). The University undergraduates have been reported to contribute to life-saving through voluntary blood donations which have been long term and less risky. They also act as role models and motivators that increase the number of voluntary blood donors on the campuses (10). There is a need to have and maintain a pool with satisfactory number of voluntary young adult blood donors which constitute a large proportion of undergraduates. This would guarantee a sufficient, safe, continuous and timely blood supply that meets the clinical demands (11).The practice of and identification of factors affecting blood donation among this population needs to be well studied so as to improve on the recruitment of safe low risk donors. Therefore, this survey was carried out to assess the knowledge levels, behaviours and identify barriers to blood donation among students in the College of Health Sciences of a private university in Nigeria.

Methodology

This descriptive cross-sectional study was conducted between January and June 2023 among students of the College of Health Sciences and Pharmacy at the Igbinedion University Teaching Hospital (IUTH) campus, Okada, located approximately 65km from Benin City in South-South Nigeria.

Study Instrument:

A 41-item structured questionnaire was used for data collection. The questionnaire was adapted by the researchers specifically for this study, guided by an extensive review of literature on voluntary blood donation practices among university students. Items were designed to address four domains: socio-demographic characteristics, knowledge levels, behaviours, and perceived barriers to voluntary blood donation.

Questionnaire development and validation:

The questionnaire underwent a rigorous validation and refinement process. Content validation was carried out by experts who assessed the instrument for clarity, relevance and adequate coverage of the study domains. Following expert review, the questionnaire was pre-tested among 20 students from a different college in the university who were not part of the main study population. To determine its reliability, internal consistency was assessed using Cronbach’s alpha, yielding a coefficient of 0.81 which indicated good reliability. Feedback obtained from the pre-test guided the refinement of the instrument leading to the removal of ambiguous items and improved clarity across the questionnaire.

Sampling Method and Selection Criteria:

A simple random sampling method was employed to identify student's eligibility for participation in the study. Only registered students of the College of Health Sciences and Pharmacy who were aged 16 years and above, present during data collection, and willing to participate in the survey were included. Students who were younger than 16years, not willing to participate in the survey or had been involved in the pilot testing were excluded. All eligible students who met the inclusion criteria and consented to participate were included, resulting in a total of 628 respondents who completed the survey and were incorporated into the final analysis.

Sample Size Determination:

The minimum required sample size was calculated using the Yamane (1967) (12) formula for finite populations:

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

Where:

n = minimum required sample size

N = 3,000 (estimated student population of the Colleges of Health Sciences and Pharmacy)

e = margin of error (set at **0.05**)

The target sample size for this study was set at 628 respondents. This figure was determined to ensure sufficient statistical power for detailed analyses extending beyond simple population estimation. An initial calculation using the Yamane formula for a finite population (N = 3,000) with a 5% margin of error yields a minimum sample size of 353 respondents.This would be sufficient for estimating overall proportions.

Data Collection and Analysis:

Data were collected using the self-administered questionnaire distributed during scheduled academic activities. Completed questionnaires were retrieved immediately to maximize response rate. Data were analyzed using IBM SPSS Statistics version 25. Descriptive statistics such as frequencies, percentages, and means were used to summarize the data, which were presented in tables.

Results

A total of six hundred and fifty questionnaires were shared with a response rate of 96.6%.The female respondents were 443 (70.5%) while the male was 185 (29.5%). Majority 572(91.1%) of the participants were Christians with 48(7.6%) Muslims and 8 (1.3%) traditionalists. Most of the respondents were single 594(94.6%) and 34 (5.4%) married as in Table 1.The senior medical students were in the majority of the participants being 230(36.6%) while the nursing sciences was 181(28.8%), senior pharmacy students were 164 (26.1%) and the senior medical laboratory sciences students 53(8.4%). Table 2a shows that 93.9% of the respondents agreed that blood donation is a good idea while 83.4% believe it is a healthy exercise. Ninety-six-point five percent of the respondents were aware that blood donation saves life while 59.6% don't know the duration of the process. More than half of the respondents434 (69. 1%)were aware that the minimum age for blood donation eligibility is 18 years while 264(42%) knew that blood collected at donation is less than500mls.More than half of the respondents362 (57.6%) were aware that a prospective blood donor needs to weigh at least 50kg, while193(30.7%) don't know the cut off weight for donor eligibility. In Table 2b, most 434(79.3%) of the

respondents were aware that the interval between blood donations by a donor would be at least three months. Majority of respondents 443(70.5%) admitted that free health check is a benefit of blood donation. Less than half of respondents 289(46%) realised that the ideal source of blood donors should be voluntary while 233(37.1%) believe it should be relatives and friends who are replacement donors. Most 563(96.9%) of our respondents were aware that both male and female donate blood if eligible. A good part of respondents 570(90.8%) were aware that pregnant women are not eligible to donate blood while 478 (76.1%) are also aware that lactating mothers can't give blood. Five hundred and six 506 (80.6%), 456(72.6%), 538(85.7%) of respondents were aware that menstruating women, commercial sex workers and intravenous drug users are disqualified from blood donation. In Table 3, almost half 283 (45.1%) of the respondents believed that blood donation is a health risk. One hundred and fifty-five (28.2%) of the respondents ever donated blood while majority 473 (71.8%) have never done so. Seventy-six (49%) of the respondents who ever donated blood did it voluntarily while 36(23.2%) were replacement blood donors,4(2.6%) donated for incentives and 9(5.8%) just needed to know their HIV/Hepatitis status. A significant number 370 (61.3%) of the respondents thought that a blood donor can get infected with HIV or hepatitis virus through the blood donation process. Most of the students 374(60.9%) were not willing to be a regular voluntary blood donor. Table 4 shows that the majority of the respondents 514(81.9%) did not have adequate information about blood donation which is a major barrier to their showing interest in the process. All the respondents 628(100%) do not like the idea of blood donation while 193(30.7%) said no one has requested them to donate blood. Some 102(7.8%) never thought of blood donation, 128(20.4%) assumed they are medically unfit while 113(8.6%) were afraid of needle pain. Some of the respondents 48(2.7) were afraid of contracting HIV and hepatitis viruses through blood donation. Other barriers to blood donation among the respondents were worry about appropriate use of donated blood 29 (2.2%), religious beliefs 16 (1.2%), lack of motivators or gift items 21 (1.6%), tight lecture schedules 32 (2.4%) and fear of HIV screen which would reveal their status 18 (0.9%).

Table 1
Socio demographic data of respondents

Variables	Frequency	Percentage (%)
Age Group (yrs)(n = 628)		
n = 628		
16–23	467	74.5
24–31	134	21.3
32–39	20	3.2
40–47	7	1.1
Gender(n = 628)		
Female	443	70.5
Male	185	29.5
Religion(n = 628)		
Christianity	572	91.1
Islam	48	7.6
Traditional	8	1.3
Marital status(n = 628)		
Single	594	94.6
Married	34	5.4
Departments(n = 628)		
Medicine and Surgery	230	36.6
Nursing sciences	181	28.8
Medical Lab sciences	53	8.4
Pharmacy	164	26.1

Table 2
a: Knowledge of Respondents

Variables	Frequency	Percentage
Is blood donation a good idea? (n = 628)		
Yes	590	93.9
No	15	2.4
I don't know	23	3.7
Is it healthy to donate blood? (n = 628)		
Yes	524	83.4
No	33	5.3
I don't know	71	11.3
Where is the venue of blood donation? (n = 553)		
Health centre	328	59.3
Donation centre	214	38.7
Red cross centre	11	2.0
Is the goal of blood donation to save a life? (n = 628)		
Yes	606	96.5
No	5	0.8
I don't know	17	2.7
What is the duration of blood donation process (n = 628)		
Approx 20mins	142	22.6
Approx 30mins	112	17.8
I don't know	374	59.6
What is the minimum age to donate blood? (n = 628)		
18years	434	69.1
25years	31	4.9
I don't know	163	26
What volume of blood is taken from a donor at donation? (n = 628)		
< 500mls	264	42
> 500mls	104	16.6
I don't know	260	41.4
What should be the weight of a blood donor? (n = 628)		
> 50kg	362	57.6
< 50kg	73	11.6

Variables	Frequency	Percentage
I don’t know	193	30.7

Table 2
b Knowledge of Respondents

Variables	Frequency	Percentage (%)
What should be the interval between donations? (n = 547)		
One month	50	9.1
Two months	63	11.5
Three months	434	79.3
Is free health check a benefit of blood donation? (n = 628)		
Yes	443	70.5
No	67	10.7
I don't know	118	18.8
What is the ideal source of donor blood? (n = 628)		
Relatives and friends (replacement)	233	37.1
Voluntary for anyone in need	289	46
I don't know	96	15.3
Paid persons	10	1.6
What gender should donate blood ?(n = 581)		
Men only	15	2.5
Women only	3	0.5
Men and women	563	96.9
Can the pregnant woman donate blood? ( )		
Yes	9	1.4
No	570	90.8
I don't know	49	1.8
Can the lactating mother donate? (n = 628)		
Yes	36	5.7
No	478	76.1
I don't know	114	18.3
Can the menstruating woman donate blood? N = 628		
Yes	56	8.9
No	506	80.6
I don't know	66	10.5
Can the commercial sex worker donate? N = 628		
Yes	79	12.6

Variables	Frequency	Percentage (%)
No	456	72.6
I don’t know	93	14.8
Can the intravenous drug user donate blood? n = 628		
Yes	21	3.3
No	538	85.7
I don’t know	69	11
Can a prospective blood donor get infected with HIV or hepatitis virus through a donation process? (n = 605)		
Yes	**370**	**61.2**
No	**177**	**29.3**
I don’t know	**58**	**9.6**

Table 3
Behaviours of Respondent towards blood donation

Variable	Frequency	Percent
Is blood donation important? (n = 628)		
Yes	547	87.1
No	41	6.5
I don't know	40	6.4
Is blood donation a health risk? (n = 628)		
Yes	283	45.1
No	249	39.6
I don't know	96	15.3
Have you ever donated blood? (n = 628)		
Yes	155	28.2
No	473	71.8
Why did you donate blood? (n = 155)		
For a friend or relative	30	19.4
Voluntary for anyone in need	76	49
An emergency case	36	23.2
For incentives	4	2.6
To know HIV or hepatitis status	9	5.8
Are you willing to donate blood in future? (n = 612)		
Yes	395	64.5
No	104	17
I don't know	113	18.5
Would you be willing to donate blood voluntarily? (n = 608)		
Yes	427	70.2
No	113	18.6
I don't know	68	11.2
Can a blood donor get infected with HIV or hepatitis virus through the donation process? (n = 605)		
Yes	370	61.2
No	177	29.3
I don't know	58	9.6
Are you willing to be a regular voluntary blood donor ? (n = 614)		
Yes	151	24.6

Variable	Frequency	Percent
No	374	60.9
I don't know	89	14.5
Would you encourage others to donate blood? (n = 588)		
Yes	504	85.7
No	35	6
I don't know	49	8.3

Table 4
Barriers to blood donation

Barriers	Responses	
	Frequency of positive response	Percent
Fear of HIV screen	18	2.9
Felt medically unfit	128	20.4
Lack of adequate information about blood donation	514	81.9
Fear of needle pain	113	18.0
Lack of opportunity	124	19.7
No one has requested me to donate	193	30.7
Has never thought about blood donation	102	16.2
Do not like the idea of blood donation	628	100
Fear of exposure to HIV/ hepatitis	48	7.6
Tight lecture schedules	32	5.1
Lack of motivators, gift items or souvenirs	21	3.3
Religious beliefs	16	2.5
Worry about appropriate use of donated blood	29	4.6

Discussion

We conducted our study among senior academicstudents' levels of the health professionsin the College of Health Sciencesof the Igbinedion University, Nigeria.The study showed that themajority of the respondents (467; 74.5%) were in the age group 16-23years with a mean age of 19.5 years which is similar to reported 18.6 years in another study in Nigeria(13). The female students were 70% of the respondents in our study, which corroborates the female predominance of 60% which was reported among undergraduates in another part of Nigeria (13) but higher than the findings in Ethiopiawith 37% female participants (15). InNigeria, the latest trend is that the young male adultseems to be more interested in doing business and acquiring wealth than improving their level of knowledge by his attendance in the

university.Five hundred and ninety(93.9%) of our respondents agreed that blood donation is a good ideawhich is similar to a report of 90.3% among students in Ethiopia (15).Majority (606,96.5%) of the respondents in our studywere aware that blood donation saves lives. Our finding is comparable to a previous finding of 95% among undergraduate studentsin

Enugu, Nigeria (16).Majority 547 (87.1%) of our study respondents believed that blood donation is important for the community. This finding is in keeping with a reported high value of (99.2%) in Saudi Arabia (17).More than half of the respondents (328, 59.3%) thought that the venue of blood donation is the health centre while two hundred and fourteen(214, 38.7%)wereaware that blood collection venue is the donation centre. Theknowledge ofblood donation location has reportedly been identified as one of the positive predictors of blood donation in a previous study(18). Less than half of the respondents 289(46%) in this study were aware that the ideal source of blood donors should be voluntary. Less than half 233(37.1%) of the students think relatives and friends who are replacement donors would be the ideal source of blood for donation. A good number of the respondents in our current study 427(70.2%) would be willing to donate blood voluntarily. Most (374, 60.9%) of the respondents are not willing to be regular blood donors in our study. Overall, the level of knowledge of the respondents about blood donation was inadequate in our study contrary to a previous report (14).One hundred and fifty-five (155, 28.2%) of our respondents ever donated blood.Our finding is higher than reports in previous studies with 13.3% (17), 15%(19) 19.6% (20)in Nigeria,while 5.5%(21) among university students in Kashmir Valley. In North East Ethiopia,12.4%of health sciences college students had donated at least once in their lifetime(22). However, our finding was lower than reported 30% in Saudi Arabia(17). Seventy-six (49%) of the respondents in our study who ever donated blood did so voluntarily. Most 427 (70.2%) of the respondents in our study would be willing to donate blood voluntarily in the future. Our finding is similar to the report of 70% from KSA (23), but higher than the reports of 59.3%(14), 59.2% (21), 62% in Ado Ekiti (13), but lower than reported 83.9% in Saudi Arabia(17). In our study,a major barrierto blood donation among the respondents was identified as lack of adequate information514(89.1%) while fear was reported as a major barrier in previous studies in Abakaliki 53.8% (13),Ekpoma 40.7% (24) in Nigeria.All 628 (100%) students do not like the idea of blood donation in our study. About one third193(30.7%) of respondents reported that no one requested them to donate blood in our study.Our finding is much lower than 40.75% (25) in North Indiawhere the most common barrier to blood donation was lack of request to do soamong studied students. In our study, 370 (61.2%) of the respondents had the misconception that a blood donor could contract HIVor hepatitis virus through the donation process.Our finding is at par with previous reports in Lagos and Iran with 52.4% (26) and Iran 66,6% (27) misconception levels.Lower reports of such misconceptions are 26% among university students in KSA in Saudi Arabia (23),17% in Ghana (28).The high level of misconception in our current surveyand other previous reports is due to lack of awareness about HIV/Hepatitis modes of transmission among the studied undergraduates. In conclusion, the knowledge of blood donation was inadequate, and a low practice of blood donation was found among the studied students. The major barrier to blood donation among our study population was lack of adequate information and also that they were not requested to donate by anyone. There is a high level of misconception about the acquisition of HIV/Hepatitis infection through blood donation. Health education with extensive voluntary blood donation campaigns is required on the campuses. If awareness is created, this will improve the knowledge and practice of our students' about voluntary blood donation. The myth and misconceptions about acquiring HIV and hepatitis through blood donation will also be addressed by increasing awareness on the modes of transmission of these viral infections among the undergraduate

Declarations

Ethical committee

The Igbinedion university Ethics committee had approved this survey in accordance with the principles of Declaration of Helsinki

Ethics statement

Consent to publish

Not applicable

Consent to participate

Informed consent was obtained from all study participants

Competing interests

We declare no competing interests.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors

Author Contribution

T B and . OA conceptualized the idea of this research. All authors shared the questionnaires among respondents in the surveyT B and OA analysed and interpreted the data collected from the respondentsAll authors wrote and reviewed the manuscript

Data Availability statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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