



Attitudes of Healthcare Workers toward Autologous Blood Donation in a Nigerian Tertiary Health Facility

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ABSTRACT

Background: Blood transfusion is essential in healthcare, yet Nigeria faces chronic blood shortages, transfusion-transmissible infections, and reliance on replacement/commercial donors. Autologous blood donation (ABD) reduces donor-related risks but remains underutilised. Healthcare workers' (HCWs) attitudes likely influence its adoption.

Methodology: A cross-sectional survey was conducted in August 2025 at the Federal University of Health Sciences Teaching Hospital, Azare, Nigeria. Medical doctors, nurses/midwives, and medical laboratory scientists involved in transfusion related care were recruited via stratified random sampling. Of 547 eligible HCWs, 249 were selected; after 12 exclusions (unavailable), 237 participated. A structured, pretested self-administered questionnaire (Cronbach's $\alpha = 0.7$) assessed attitude through five Likert-scale items on safety, willingness to recommend, support for routine use, perceived resources, and cost-worth. A composite attitude score was created from the four attitude-focused items. Data were analysed with SPSS 26 using descriptive statistics, chi-square, and Fisher's exact tests ($p \leq 0.05$).

Results: The 237 participants comprised 59 doctors (24.9%), 162 nurses/midwives (68.4%), and 16 medical laboratory scientists (6.7%). Mean age was 32.97 ± 9.6 years; 55.7% were female. Overall, 79.7% had a positive attitude (composite score ≥ 4). Positive attitudes were significantly associated with professional cadre ($p < 0.001$) but not with gender ($p = 0.18$), age group ($p = 0.32$), years of experience ($p = 0.41$), or marital status ($p = 0.76$). Across all groups, most respondents perceived ABD as safe and were willing to recommend it, though fewer agreed that workplace resources were adequate.

Conclusion: HCWs hold generally favourable attitudes toward ABD. Cadre-related differences and pervasive resource concerns highlight the need for targeted training, standardised protocols, and strengthened institutional support to translate positive attitudes into routine ABD practice.

Keywords: Attitude, Autologous blood donation, Blood Transfusion, Healthcare workers, Nigeria

1. INTRODUCTION

Nigeria, the most populous country in Africa, operates the National Blood Service Agency (NBSA), mandated to coordinate blood collection, testing, and distribution nationwide¹. Despite this, transfusion services are plagued by inadequate blood supplies, dependence on replacement and commercial donors, and ongoing risks of transfusion-transmissible infections (TTIs)¹⁻³. A six-year review from a major teaching hospital in Lagos reported that only 12.3% of donors were voluntary non-remunerated, with most donations from higher-risk sources and a substantial burden of TTIs^{2,3}.

In this context, autologous blood donation (ABD) offers a viable alternative. ABD involves collecting and storing a patient's own blood via pre-deposit donation, intraoperative blood salvage, or acute normovolemic haemodilution for re-transfusion during surgery^{4,5}. It reduces reliance on donor blood, eliminates TTIs, lowers immunologic complications, conserves scarce resources, and benefits patients with rare blood types or complex antibodies^{5,6}. Its use has been linked to improved surgical outcomes and patient safety⁴⁻⁷.

Healthcare workers which include doctors, nurses, laboratory scientists, and blood bank staff are central to the transfusion process, from donor recruitment and testing to transfusion administration and patient counselling, including promoting ABD^{1,8-11}. Despite these benefits, ABD remains underutilised in Nigeria. Persistent blood shortages, reliance on replacement donors, and limited familiarity with ABD, coupled with barriers such as logistics, cost, patient eligibility, and lack of institutional protocols, reduce clinicians' willingness to recommend or implement ABD^{4,12-14}. These barriers diminish clinicians' willingness to recommend or organise ABD, thereby reducing its clinical uptake. Healthcare workers' attitudes are therefore critical determinants of ABD uptake. Limited exposure, mixed perceptions, and gaps in transfusion training contribute to suboptimal adoption of blood-management strategies^{13,14}. Understanding these attitudinal factors is essential for designing interventions such as targeted training, standardised protocols, and institutional support to promote appropriate ABD use. Although studies have assessed knowledge and blood donation practices among healthcare workers in Nigeria, there is a paucity of data specifically evaluating their attitudes toward autologous blood donation in tertiary health facilities. While one study examined surgeons' disposition toward ABD in southeastern Nigeria,⁴ no published work has specifically assessed the attitudes of a broad range of HCWs in northeastern Nigeria. This study aimed to assess the attitudes of HCWs toward ABD in a tertiary healthcare facility in Azare, Bauchi State, a region with unique blood-supply challenges and a newly upgraded teaching hospital serving three states.

2. METHODOLOGY

2.1 Study Area

The study was conducted at the Federal University of Health Sciences Teaching Hospital (FUHSTH), Azare, Bauchi State, North-eastern Nigeria. The hospital was originally established as a Federal Medical Centre in 2000 following the federal government's take-over of a long-standing general hospital and was upgraded to a teaching hospital in 2024, becoming affiliated with the Federal University of Health Sciences, Azare. FUHSTH Azare has 26 departments, comprising 16 clinical and 10 administrative units, and provides services to all senatorial districts in Bauchi State and neighbouring Yobe and Jigawa States. The hospital expanded from 152 beds at inception to 412 beds by 2022 and offers comprehensive emergency, routine, and specialised care alongside training and research. For this study, research activities were coordinated within clinical, nursing, and pathology departments to ensure protocol adherence and data quality.

2.2 Study Design

This was a cross-sectional study involving the administration of a structured questionnaire to the study subjects. The study was carried out over a one-month period, from 1st to 31st August 2025, at the nursing, pathology and clinical departments of Federal University of Health Sciences Teaching Hospital, Azare, Bauchi State.

2.3 Study Population

The study population comprised healthcare workers at the Federal University of Health Sciences Teaching Hospital, stratified into medical doctors (consultants, residents, medical officers, and house officers), nurses/midwives, and medical laboratory scientists

who were directly or indirectly involved in blood transfusion services, preoperative preparation, or surgical care. Healthcare workers outside these professional categories and those on leave during the study period were excluded.

Sample Size /Sample Technique

Sample size was calculated using the formula for descriptive studies:¹⁵

$$n = \frac{Z^2 \cdot XpX(1-p)}{d^2}$$

Using the formula for descriptive studies ($Z=1.96$, $p=0.5$, $d=0.05$), an initial sample of 384 was obtained. With a finite population of 547, the corrected size was $nf = 384 / (1 + 383/547) \approx 226$. Adding 10% for non-response gave a final target of 249. Subsequently, 249 HCWs were selected using stratified random sampling with proportional allocation (doctors 62, nurses 169, laboratory scientists 18), and simple random sampling within each stratum. Twelve selected participants (2 laboratory scientists, 3 doctors, 7 nurses) were on leave; thus 237 HCWs completed the questionnaire and were analysed.

2.4 Study Instrument

The study questionnaire was designed based on a comprehensive review of relevant published literature, World Health Organization (WHO) recommendations, and established transfusion medicine guidelines on ABD.¹⁶⁻¹⁹ It contained socio-demographic items and five Likert-scale statements (1 = strongly disagree to 5 = strongly agree):

1. ABD is a safe practice.
2. I would recommend ABD to eligible patients.
3. ABD should be routinely practised in elective surgeries.
4. There are sufficient resources in my workplace to support ABD.
5. Implementing ABD programmes is worth the cost and effort.

Items 1–3 and 5 were considered direct measures of attitude; item 4 reflects perceived institutional barriers.

A pilot study was conducted at the Federal Medical Centre, Misau, Bauchi State, with 24 healthcare workers (6 doctors, 16 nurses, and 2 medical laboratory scientists), representing 10% of the intended sample, selected via simple random sampling. Reliability of the instrument was assessed using the pilot data, yielding a Cronbach's alpha of 0.7, indicating acceptable internal consistency. Face validity was assessed by subject experts in transfusion medicine and public health, and the questionnaire was pre-tested among HCWs, assessing the relevance, coverage, and appropriateness of each item to the study objective. Feedback from experts and pilot participants was utilised to refine the questionnaire, enhance clarity, eliminate ambiguous terms, and ensure that the instrument effectively measured the intended attitude on autologous blood donation. Variables collected and analysed included age, sex, professional cadre, years of experience, and marital status. Prior transfusion medicine training and previous exposure to autologous blood donation (ABD) were not collected and are acknowledged as study limitations.

2.5 Data Collection

A structured, pre-tested, self-administered questionnaire was used to collect data on attitude regarding ABD. The questionnaire was distributed to selected participants by simple random sampling across various departments, including clinical, laboratory, and nursing departments. Before administration, participants

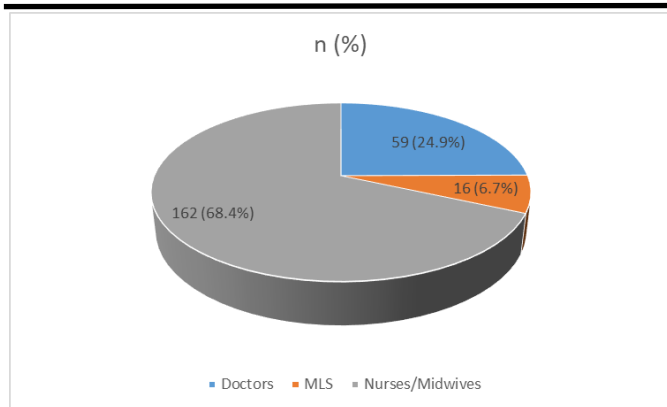


Figure 1: Pie Chart Showing the Cadre of the Participants

were briefed on the purpose, and informed consent was obtained. Participation was voluntary, and data collection was conducted over the course of one month.

Collected data was securely stored in password-protected digital files and coded to ensure participant anonymity.

2.6 Data Analysis

Data were analysed with SPSS 26. Descriptive statistics summarised socio-demographics and item responses. For each attitudinal item, associations with cadre and gender were tested using chi-square or Fisher's exact test (when expected cell frequencies were <5). A composite attitude score was computed as the mean of items 1, 2, 3, and 5, and categorised as positive (≥ 4), neutral (3–3.9), or negative (< 3). The composite outcome was then compared across cadre, gender, age group, years of experience, and marital status using chi-square/Fisher's exact tests. Significance was set at $p \leq 0.05$.

2.7 Ethical Approval

Ethical approval was obtained from the Health Research Ethics Committee (HREC) of the Federal University of Health Sciences Teaching Hospital, Azare (FUHSTH), with the number NHREC/

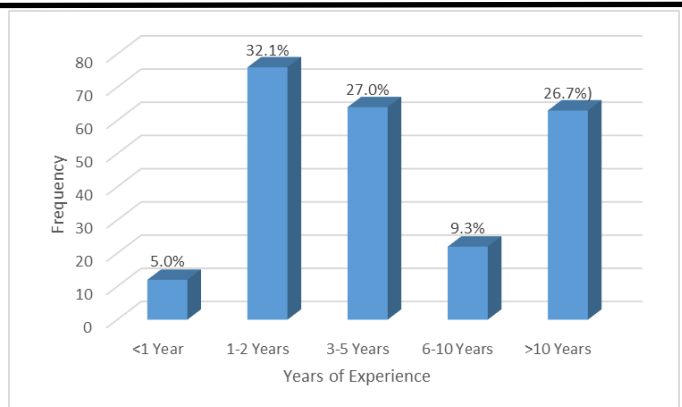


Figure 2: Bar Chart Showing the Work Experience of the Participants

FUHSHA/11/11/24. Participation was voluntary, confidentiality was maintained, and procedures were aligned with the Declaration of Helsinki. Written informed consent was obtained from all respondents.

3. RESULT

A total of 237 healthcare workers participated in the study, comprising 16 (6.7%) medical laboratory scientists, 59 (24.9%) doctors, and 162 (68.4%) nurses/midwives, as illustrated in Figure 1. The mean age of the study participants was 32.97 ± 9.6 years with a range of 21 to 63 years. The participants consisted of 105 (44.3%) males and 132 (55.7%) females.

The marital status of the participants showed that 118 (49.8%) were married, 114 (48.1%) were single, 4 (1.7%) were widowed, and 1 (0.4%) was a widower. The nurses/midwives were from the nursing services department, the medical laboratory scientists were from the pathology department while the doctors were from the various departments of the hospital. Figure 2 shows the participants' years of work experience, with the majority having 1–2 years of experience 76 (32.1%).

Table 1: Attitude Towards ABD by Professional Cadre (Row Percentages)

Item	Response	Doctors (n=59)	MLS (n=16)	Nurses (n=162)	Fisher's Exact	P-value
ABD is safe	Strongly Agree	76.3%	87.5%	40.7%	30.35	<0.0001
	Agree	20.3%	12.5%	42.0%		
	Neutral	1.7%	0%	13.0%		
	Disagree/Strongly Disagree	1.7%	0%	4.3%		
I would Recommend ABD	Strongly Agree	71.2%	81.3%	30.2%	45.40	0.0001
	Agree	25.4%	18.8%	55.6%		
	Neutral	1.7%	0%	8.6%		
	Disagree/Strongly Disagree	1.7%	0%	5.6%		
Routine Practice in Elective Surgeries	Strongly agree	52.5%	62.5%	22.2%	23.56	0.001
	Agree	25.4%	25.0%	35.8%		
	Neutral	15.3%	12.5%	25.3%		
	Disagree/Strongly Disagree	6.8%	0%	16.7%		
Sufficient Workplace Resources	Strongly Agree/Agree	20.3%	62.5%	41.4%	22.11	0.004
	Neutral	42.4%	31.3%	38.3%		
	Disagree/Strongly disagree	37.3%	6.3%	20.4%		
ABD Programmes Worth Cost/Effort	Strongly Agree/Agree	79.7%	87.5%	62.9%	17.13	0.006
	Neutral	18.6%	12.5%	27.8%		
	Disagree/Strongly Disagree	1.7%	0%	6.8%		

Table 2: Attitude Towards ABD by Gender

Item	Response	Male (n=105)	Female (n=132)	Fisher's Exact	P-value
ABD is Safe	Strongly Agree	59.0%	47.7%	12.21	0.012
	Agree	29.5%	38.6%		
	Neutral	6.7%	11.4%		
	Disagree/Strongly Disagree	4.8%	2.3%		
I Would Recommend ABD	Strongly Agree	55.2%	34.8%	10.63	0.032
	Agree	36.2%	53.0%		
	Neutral	5.7%	6.8%		
	Disagree/Strongly Disagree	2.9%	5.3%		
Routine Practice	Strongly Agree/Agree	69.5%	61.4%	5.02	0.279
	Neutral	19.0%	24.2%		
	Disagree/Strongly Disagree	11.4%	14.4%		
Sufficient Resources	Strongly Agree/Agree	29.5%	43.9%	8.18	0.083
	Neutral	39.0%	38.6%		
	Disagree/Strongly Disagree	31.4%	17.4%		
Worth Cost/Effort	Strongly Agree/Agree	64.8%	72.0%	5.70	0.200
	Neutral	25.7%	23.5%		
	Disagree/Strongly Disagree	9.5%	4.5%		

3.1 Attitude by Cadre (Table 1)

Doctors and medical laboratory scientists (MLS) showed stronger agreement that ABD is safe (doctors 76.3% strongly agree, MLS 87.5%) compared to nurses (40.7% strongly agree; Fisher's exact = 30.35, $p < 0.0001$). A similar pattern was seen for willingness to recommend (doctors 71.2% strongly agree, MLS 81.3%, nurses 30.2%; $p = 0.0001$) and support for routine practice ($p = 0.001$). Conversely, most respondents disagreed that resources were adequate (doctors 37.3% disagree/strongly disagree, nurses 20.4%; $p = 0.004$). Nonetheless, the majority agreed that ABD programmes are worth the cost/effort ($p = 0.006$). Row percentages are displayed.

3.2 Attitude by Gender (Table 2)

Males were more likely to strongly agree with safety (59.0% vs. 47.7%; $p = 0.012$) and to strongly agree with recommending ABD (55.2% vs. 34.8%; $p = 0.032$). No significant gender differences emerged for routine practice ($p = 0.279$), perceived resources ($p = 0.083$), or cost-worth ($p = 0.200$).

3.3 Overall attitude (Table 3)

The composite attitude score showed 79.7% (189/237) with a positive attitude, 15.2% neutral, and 5.1% negative. The proportion with a positive attitude varied significantly by cadre (doctors 88.1%, MLS 93.8%, nurses 75.3%; $p < 0.001$). There were no significant differences by gender ($p = 0.18$), age group ($p = 0.32$), years of experience ($p = 0.41$), or marital status ($p = 0.76$).

4. DISCUSSION

In this study, nurses and midwives constituted the largest proportion of respondents, followed by doctors and medical laboratory scientists (MLS), reflecting the typical staffing structure of tertiary healthcare facilities in Nigeria and similar low- and middle-income countries^{20,21}. Nurses/midwives were generally younger and less experienced, while doctors and MLS were predominantly middle-

aged with longer professional experience. Younger healthcare workers may be more receptive to newer concepts such as patient blood management (PBM) and autologous blood donation (ABD), whereas more experienced professionals may possess greater practical knowledge but less exposure to evolving transfusion strategies without continuous professional development^{22,23}. Females predominated across all cadres, reflecting the feminization of the healthcare workforce in sub-Saharan Africa¹⁶. Greater work experience has also been linked to increased confidence in transfusion decision-making and engagement with alternative blood conservation strategies such as ABD^{24,25}.

This study reveals predominantly favourable attitudes toward ABD among HCWs in a Nigerian tertiary hospital. The high composite positivity (79.7%) aligns with the recognised safety and clinical benefits of ABD^{5,6,16}. However, the significant cadre-based differences, with doctors and MLS consistently more positive than nurses, this mirrors findings that physicians and laboratory professionals often have deeper transfusion-specific training and greater decisional autonomy^{9,22}.

Nurses expressed greater neutrality and disagreement, particularly on routine ABD practice and recommendation. This may reflect their frontline concerns about additional workloads, staffing, and perioperative logistics, concerns documented in other resource-limited settings^{26,27}. Importantly, the perception that insufficient workplace resources exist to support ABD was widespread across all cadres, underscoring a critical institutional barrier²⁸.

Gender differences were minimal in the composite analysis ($p = 0.18$), despite item-level differences in safety and recommendation. This suggests that while male HCWs may feel somewhat more confident in endorsing ABD, the broader attitudinal landscape is not fundamentally gendered. The lack of association between overall attitude and age, experience, or marital status indicates that professional role and training, rather than de-

Table 3: Overall Attitude Towards ABD by Sociodemographic Characteristics

Variable	Category	Positive Attitude (score ≥ 4) n (%)	Neutral/ Negative n (%)	χ^2 / Fisher's Exact	P-value
Cadre	Doctors	52 (88.1)	7 (11.9)	20.45	<0.001
	MLS	15 (93.8)	1 (6.2)		
	Nurses	122 (75.3)	40 (24.7)		
Gender	Male	88 (83.8)	17 (16.2)	1.81	0.18
	Female	101 (76.5)	31 (23.5)		
Age group (years)	<30	68 (77.3)	19 (22.7)	2.27	0.32
	30–39	79 (82.3)	17 (17.7)		
	≥ 40	42 (76.4)	12 (23.6)		
Years of experience	<1	9 (75.0)	3 (25.0)	2.89	0.41
	1–5	105 (79.5)	27 (20.5)		
	6–10	45 (83.3)	9 (16.7)		
	>10	30 (76.9)	9 (23.1)		
Marital status	Married	95 (80.5)	23 (19.5)	0.09	0.76
	Single	90 (78.9)	24 (21.1)		
	Widowed	4 (80.0)	1 (20.0)		

Positive attitude: mean score of items 1,2,3,5 ≥ 4 . Neutral: 3–3.9; Negative: <3.

Fisher's exact test used where expected frequencies <5.

Widower (n=1) excluded from marital status analysis due to small cell size.

mographics, are the principal drivers of attitude.

4.1 Conclusion

HCWs at FUHSTH Azare hold generally positive attitudes toward ABD, but cadre-related differences and a shared perception of inadequate resources reveal a gap between favourable disposition and practical implementation. Targeted, cadre-specific education, development of standardised ABD protocols, and enhanced institutional support are necessary to translate positive attitudes into routine practice.

Limitation

The cross-sectional design precludes causal inference regarding the relationship between healthcare workers' characteristics and their attitudes toward ABD. Data were collected using a self-administered questionnaire, which is susceptible to social desirability and recall bias, and may have led to an overestimation of favourable attitudes. The study was conducted in a single tertiary healthcare facility, limiting the generalisability of the findings to other hospitals or regions in Nigeria. Attitudes were assessed without direct measurement of actual ABD practice, making it difficult to determine how perceptions translate into behaviour. Furthermore, the study did not collect data on prior transfusion medicine training or previous exposure to autologous blood donation, which may have influenced participants' attitudes. Furthermore, information on prior transfusion training or ABD exposure was not collected; future studies should incorporate these variables to strengthen the evidence base.

Conflicts of Interest:

None

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