

## Factors Associated with Intention to Donate Blood among Women in Nigeria

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### Abstract

**Background:** There is a shortage of data regarding the factors contributing to the low participation of women in blood donation in Nigeria. We therefore examined sociodemographic factors, knowledge of donor eligibility, donation history, deferral history, and their association with the intention to donate blood among women in Nigeria.

**Materials and Methods:** An online cross-sectional survey was conducted with 1015 women aged 18-65 in Nigeria using snowball sampling. The association between the intention to donate blood and socio-demographic factors, knowledge of donor eligibility, and donation history was assessed using logistic regression.

**Results:** Our results show that only 225(22.2%) had prior donation experience, 897(88.4%) expressed willingness to donate blood in the future, and 230(22.7%) had been previously deferred. The major reason for deferral was low haemoglobin level (46.1%). Some were, however, wrongly deferred due to menstruation (12.6%) and being female (3%). Previous blood donation experience (AOR=4.93; 95% CI: 2.10-11.54), awareness that women can be potential eligible donors like men (AOR=3.56;95%CI: 2.09-6.05), being a Muslim(AOR=2.04; 95% CI: 1.14-3.66) and previous history of deferral(AOR=2.27;95% CI: 1.20-4.30) were positively associated with the intention to donate blood in the future.

**Conclusions and Recommendations:** We concluded that past blood donation experience and awareness that women are eligible donors significantly predict the intention to donate blood among women in Nigeria. Female-targeted donor education and awareness programmes should be implemented to enhance the participation of women in blood donation in Nigeria. Further studies are necessary to explore the perspectives and concerns of women, blood bank personnel, and donor organizers regarding the eligibility of females as blood donors.

**Keywords:** Blood donation, Intention, Women, Nigeria.

### Introduction

Every year, approximately 120 million blood donations are collected worldwide, with 40% coming from high-income countries, which represents just 16% of the global population. In contrast, low-income countries, which account for more than half the world's population, collect less than 20% of global blood donations annually.<sup>1</sup>

About half of the blood collected is transfused to children under 5 years old in low-income countries, while in high-income countries, around three-quarters of the blood collected is transfused to patients aged over 60 years.<sup>1</sup> Nigeria has a population of over 200 million and requires about 2 million units of blood each year to meet demand. However, only about 500,000 units are collected annually, resulting in a shortfall of approximately 75%.<sup>2</sup> Besides the availability of blood, safety is also a concern, as most of the blood collected in Nigeria comes from family replacement and paid donors, with less than 10% sourced from voluntary, non-remunerated blood donation.<sup>2</sup>

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Lack of knowledge, misconceptions, and myths about blood donation negatively impact the practice of blood donation.<sup>3,4</sup> Consequently, donor education and awareness campaigns have proven effective for recruiting and retaining blood donors. Several studies indicate that blood donation rates are significantly higher among men than women.<sup>5-9</sup> Additionally, research shows that women are more likely to be first-time than regular donors.<sup>6,7</sup> Other factors influencing blood donation practices include age, educational status, and income level.<sup>7,8,10,11</sup> Research has also demonstrated that the intention to donate blood can predict actual donation practices.<sup>12,13</sup> Experience as a donor, age, and educational level have also been found to influence future intentions to donate blood.<sup>14-16</sup>

In Nigeria, even though women make up more than half of the population, their participation in blood donation is less than 10%.<sup>17-20</sup> There is a lack of data regarding the factors responsible for this significant gender gap in blood donation in Nigeria. Understanding these factors will help policymakers and stakeholders determine how to bridge the gap between male and female participation, ultimately increasing the supply of donated blood in Nigeria. Therefore, this study aimed to examine sociodemographic factors, knowledge of donor eligibility, donation history, deferral history, and their association with the intention to donate blood among women in Nigeria.

## Materials and Methods

We conducted an online cross-sectional descriptive study among 1,015 women aged 18 and older in Nigeria. The survey link was shared using snowball sampling. The survey included an information section where participants were informed about the purpose of the study and confidentiality, as well as an informed consent section where they could choose to consent or decline participation. Only those who agreed to participate could move on to the other sections and answer the questions in this survey. The survey questions included sociodemographic characteristics and blood donation-related information, such as donation status, deferrals, willingness to donate blood in the future, and knowledge of donor eligibility. Ethical clearance for this study was obtained from the Ethics Review Committee of the University of Ilorin Teaching Hospital, Ilorin (Approval number: ERC PAN/2021/09/0198).

## Data analysis

Data from the survey were analyzed using IBM Statistical Package for Social Sciences (SPSS) version 23. An independent t-test was used to compare the mean ages of those willing and unwilling to donate blood in the future. A chi-squared test was employed to assess the differences in sociodemographic variables, knowledge of donor eligibility, blood transfusion, and donation history between those willing and those unwilling to donate blood in the future. A p-value of 0.05 was considered statistically significant. To determine the predictors of the intention to

donate blood, variables with a p-value of less than 0.25 from bivariate analysis were entered into the logistic regression model. The results were reported using adjusted odds ratios (AOR) and a 95% confidence interval.

## Results

### Socio-demographic characteristics and blood donation history

A total of 1,015 women aged 18 to 65, with a mean age of  $34.86 \pm 11.29$  years, participated in this study. Five hundred eighty-six (57.7%) were married, 248 (24.4%) were Muslims, and 722 (71.1%) were employed. (Table 1) Two hundred and twenty-five (22.2%) had previously donated blood (blood donors), while 790 (77.8%) had never donated blood (non-donors). Additionally, 897 (88.4%) were willing to donate blood in the future, and 230 (22.7%) had a prior history of deferral from blood donation. (Table 2) The major reason for deferral was a low hemoglobin level (46.1%); however, some were wrongly deferred due to menstruation (12.6%) and female gender (3%). (Figure 1) Among the blood donors, the majority, 105 (46.7%), had donated only once. Among the non-donors, 163 (20.6%) had attempted to donate previously but were deferred. (Table 2)

### Knowledge of blood donation eligibility

Regarding knowledge of blood donation eligibility, 793(91.6%) were aware that women are eligible to donate blood just like their male counterparts, 715(70.4%) knew the minimum age and only 361(35.6%) knew the minimum weight required for an eligible blood donor. (Table 2)

### Predictors of intention to donate blood in the future among women in Nigeria

The mean age of women willing to donate was significantly lower than that of those who were not ( $34.4 \pm 11.1$  versus  $38.2 \pm 12.3$  years, respectively;  $P=0.001$ ). Other factors positively associated with willingness to donate blood in the future, as determined by bivariate analysis, include unemployment, being of the Islamic faith, belonging to the Hausa tribe, knowledge about blood donation eligibility, and previous donation experience ( $p<0.05$ ) (Table 3). To identify the predictors of intention to donate blood in the future, variables with a p-value of less than 0.25 on bivariate analysis were included in the logistic regression model. The tribe was not added to the model due to its collinearity with religion. The logistic regression analysis revealed that the odds of willingness to donate blood were two times higher among Muslim women compared to Christian women (AOR=2.04; 95% CI: 1.14-3.66), nearly five times higher among donors than among non-donors (AOR=4.93; 95% CI: 2.10-11.54), about two times higher for those with a previous history of deferral compared to those without such a history (AOR=2.27; 95% CI: 1.20-4.30), and 3.5 times higher among those who were aware that women are

eligible to donate compared to those who lacked that knowledge (AOR=3.56; 95% CI: 2.09-6.05). (Table 3)

**Table 1: Sociodemographic characteristics of participants (n=1,015)**

Characteristics	n (%)
<b>Age (Years)</b>	
18-29	397(39.1)
30-49	506(49.9)
50-65	112(11.0)
<b>Marital status</b>	
Married	586(57.7)
Single	429(42.3)
<b>Tribe</b>	
Hausa	79(7.8)
Igbo	222(21.9)
Yoruba	477(47.0)
Others	237(23.3)
<b>Religion</b>	
Christianity	767(75.6)
Islam	248(24.4)
<b>Employment</b>	
Employed	722(71.1)
Unemployed	293(28.9)
<b>Income level</b>	
Low	204(20.1)
Medium	325(32.0)
High	486(47.9)
<b>Education</b>	
Tertiary	490(48.3)
Postgraduate	525(51.7)

**Table 2: Knowledge and practice of blood donation among women in Nigeria (n=1,015)**

Characteristics	n(%)
<b>Do you know your blood type?</b>	
Yes	980(96.6)
<b>Ever donated blood?</b>	
Yes	225(22.2)
<b>Donation details</b>	
Once	105(46.7)
2-3 times	75(33.3)
>3 times	45(20.0)
<b>Ever been deferred?</b>	
Yes	230(22.7)
<b>Deferral among non-donors</b>	
Yes	163(20.6%)
<b>Willing to donate in the future</b>	
Yes	897(88.4)
<b>Transfusion history?</b>	
Yes	537(52.9)
<b>Knowledge of minimum age of eligibility</b>	
Yes	715(70.4)
<b>Knowledge of minimum weight of eligibility</b>	
Yes	361(35.6)
<b>Knowledge of female eligibility</b>	
Yes	930(91.6)

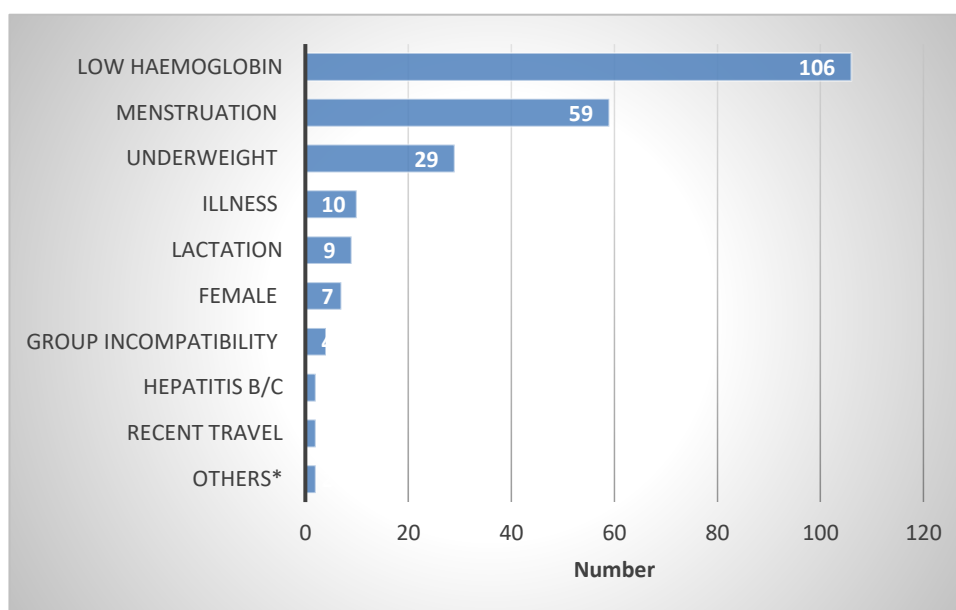
## Discussion

In this study, we assessed knowledge of donor eligibility, donation history, deferral history, and sociodemographic factors, as well as their association with intention to donate blood among women in Nigeria. Less than a quarter of the women who participated in this study had previously donated blood, and half of those with donation experience had done so only once. This aligns with previous studies.<sup>5-9</sup> WHO data on the gender profile of blood donors indicate that globally, about 33% of blood donations come from women; however, there is considerable variation among countries, with women in around 15 countries, including Nigeria, contributing less than 10%.<sup>1</sup> Two hundred and thirty participants had a history of deferral from blood donation, with the main reason

reported by 46.1% being low hemoglobin levels. This is in keeping with the studies conducted in Southern Nigeria,<sup>21</sup> India,<sup>22,23</sup> Pakistan,<sup>24</sup> and Spain.<sup>25</sup> Several studies have also reported a significantly higher deferral due to low haemoglobin levels among females compared to males.<sup>25,26</sup> Although menstruation is not typically a reason for deferral, except in women with regular, excessive menstrual bleeding and low haemoglobin levels<sup>27</sup>, this study found that menstruation was reported as the second most common reason for deferral (25.7%). This is due to some blood bank staff in Nigeria deferring women in their menstrual period regardless of haemoglobin levels. [unpublished data]. The concern for jeopardizing the health of a woman who volunteers to donate blood while menstruating is significant. It has been shown that regular menstruation does not affect a woman's ability to donate as long as she is not experiencing heavy bleeding and her hemoglobin is above 11 g/dl.<sup>28</sup> In a study conducted by Pedrazzini *et al.* among female blood donors in Switzerland, there was a higher incidence of restless leg syndrome (RLS) among those with hyper-menorrhea; however, no associations were found between RLS and the number of previous donations.<sup>29</sup>

**Table 3: Factors associated with intention to donate blood among women in Nigeria**

Factors	Willing to donate blood		P-value on Bivariate Analysis	Adjusted Odd Ratio (95% Confidence Interval)
	Yes n(%)	No n(%)		
<b>Mean Age(years)</b>	34.4±11.1	38.2±12.3	0.001	0.98(0.96-0.99)
<b>Marital status</b>				
Married	517(88.2)	69(11.8)	0.614	
Single	367(89.3)	44(10.7)		
<b>Tribe</b>				
Yoruba	406(85.1)	71(14.9)	0.012	
Igbo	198(89.2)	24(10.8)		
Others	219(92.4)	18(7.6)		
Hausa	74(93.7)	5(6.3)		
<b>Religion</b>				
Christianity	664(86.6)	103(13.4)	0.001	Reference 2.04(1.14-3.66)
Islam	233(94.0)	15(6.0)		
<b>Employment Status</b>				
Unemployed	270(92.2)	23(7.8)	0.017	Reference 0.8(0.43-1.48)
Employed	627(86.8)	95(13.2)		
<b>Income Level</b>				
Low	179(87.7)	25(12.3)	0.790	
Medium	285(87.7)	40(12.3)		
High	433(89.1)	53(10.9)		
<b>Ever donated blood?</b>				
No	678(85.8)	112(14.2)	0.000	Reference 4.93(2.10-11.54)
Yes	219(97.3)	6(2.7)		
<b>Ever been deferred?</b>				
No	679(86.5)	106(13.6)	0.000	Reference 2.27(1.20-4.30)
Yes	218(94.8)	12(5.2)		
<b>Transfusion history?</b>				
No	414(86.6)	64(13.4)	0.060	Reference 1.31(0.87-1.99)
Yes	483(89.9)	54(10.1)		
<b>Knowledge of age of eligible donor</b>				
No	250(83.3)	50(16.7)	0.002	Reference 1.20(0.78-1.86)
Yes	647(90.5)	68(9.5)		
<b>Knowledge of weight of eligible donor</b>				
No	558 (85.5)	95(14.5)	0.000	Reference 1.56(0.93-2.62)
Yes	338(93.6)	23(6.4)		
<b>Only men can donate, women are not eligible</b>				
TRUE	56(65.9)	29(34.1)	0.000	Reference 3.56(2.09-6.05)
FALSE	841(90.4)	89(9.6)		



**Figure 1: Reasons for blood donation deferral among women in Nigeria**  
 \* shortage of blood bank staff and short donation interval

The selection of blood donors is based on regularly reviewed criteria, ensuring no discrimination of any kind, including gender, race, nationality, or religion.<sup>27</sup> However, in this study, 3% of the deferrals were due to being female. Could this reflect discrimination or simply a belief that women are weaker than men and not fit to donate blood? Further studies are needed to explore the perspectives of blood bank personnel and donor organizers to address these questions. Studies have shown that deferral reduced the likelihood of returning to donate, especially among first-time donors.<sup>30,31</sup> However, in this study, deferral was significantly higher among donors, and over 90% of those deferred in the past expressed willingness to donate in the future.

Only 35.6% of participants (donors and non-donors) knew the minimum weight requirement for eligibility as a donor. This finding aligns with a study conducted in India, where just 27% of female college students knew the minimum body weight necessary for blood donation.<sup>32</sup> Information about the eligible weight for donors should be considered crucial and included in blood donor information flyers and campaigns.

Regarding the factors associated with the intention to donate blood, our results showed that Muslim women were twice as likely to donate compared to Christian women. In a similar study conducted in Ethiopia, Melku et al. discovered that religion significantly influenced blood donation practices; participants who identified as Protestant were more likely to express a positive attitude towards blood donation.<sup>11</sup> Another study in the United States by Beyerlein et al. examined the impact of religion on blood donation, finding that religion had significant positive effects for both organizational and subjective

dimensions of religion.

They further explained that attendance at religious services primarily operates through religious connections, which, in turn, affect various established donation channels, including solicitations to donate, directly impacting contributions and indirectly shaping moral norms and willingness to donate.<sup>33</sup>

Women with previous donation experience were found to be five times more likely to donate in the future compared to those who had never donated before, consistent with earlier studies.<sup>34,35</sup> Women who had experienced deferral were also twice as likely to donate compared to those who had never been deferred. This contrasts with previous studies suggesting that temporary deferral negatively impacts future donation intent.<sup>36,37</sup> Women who wish to donate but are temporarily deferred due to menstruation are likely to return for donation once their menstrual cycle has concluded. Awareness that women can be eligible donors was another factor influencing their intention to donate; those with this knowledge were 3.5 times more likely to be willing to donate compared to those who were unaware. Therefore, targeted donor education for women is essential to increase their participation in blood.

#### Limitations of this study

The study was conducted online, meaning that only women who were educated and had Internet access could participate.

## Conclusion

Previous blood donation experience and awareness of female donor eligibility are strong predictors of the intention to donate blood among women in Nigeria. Programs aimed at female-targeted donor education and awareness should be implemented to enhance women's participation in blood donation efforts in Nigeria. Further studies are necessary to explore the perspectives and concerns of women, blood bank personnel, and donor organizers regarding the eligibility of women as blood donors.

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