Research Article

Evaluation of Socioeconomic Factors Influencing Donor Retention in South Western Nigeria

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ABSTRACT

Background and objectives: Inadequate availability of blood remains a huge challenge to effective healthcare delivery particularly in Africa where rates of blood donation ranges from as low as 3.9 per 1,000 in West Africa to 10.4 per 1,000 in Southern Africa compared to 31.5 per 1,000 in developed countries. Factors that motivate or deter blood donation including socioeconomic factors should be identified and addressed. Low knowledge about blood donation, fear due to lack of knowledge and discouraging spiritual, religious and cultural perceptions of blood, age, educational status, income level and marital status are some socioeconomic factors affecting voluntary blood donation in Nigeria.

Materials and methods: This was a cross-sectional study design carried out among voluntary blood donors who participated in 2022 world blood donor day. Self-administered questionnaire data was analyzed using the SPSS version 25 (IBM Corporation, New York, USA).

Results: Two hundred and fifty one donors were included in this study. The mean age of the donors was 30.9 ± 11.5 years and majority (72.0%) were males. About four-fifth of the donors reside in urban center and had at least tertiary education. The average monthly income of the donors was 50,000 naira ($100). Educational level and previous blood donation were two important predictors of voluntary blood donation.

Conclusion: The identified factors that promote voluntary blood donation are higher educational level and having donated previously. Recruitment of students in higher institution of learning as first time donors and retention in the donor pool are important strategies towards self-sufficiency in blood supply.

Keywords: Socioeconomic factors; Voluntary blood donation; Blood supply

HIGHLIGHTS

- Majority of the voluntary blood donors are male aged 21-30 years.
- Having tertiary education an important predictor of donor retention.
- Previous blood donation is also found to be a predictor of williness to donate in the future.

INTRODUCTION

Voluntary blood donation is expected to be embraced by at least 1% of the population of any country to meet her blood demand. While most developed countries have well established system for voluntary blood donation, African countries, particularly Nigeria has a developing blood donation system with an abysmally low proportion of the blood donors most especially the Voluntary Non-Remunerated Donors (VNRD) [1-3]. Most of the donors in

our environment are either Family replacement or paid blood donors [2-5]. Studies have been conducted to explore the factors responsible for VNRD with contrasting reports. Some of the studies have looked into the prevalence and associated risk factors of transfusion [6]. While others focused on the knowledge, attitude and perception towards voluntary blood donation among culturally diverse Nigerian students [3,7].

In other part of the world, socioeconomic status of the prospective donors has been thought to have a great influence on donation practices, most especially the age, educational level and gender [8-10]. Most studies have also reported that age around 20-30 years, at least secondary education and male gender are the basic characteristics of most of the blood donors in Nigeria, most especially in the tertiary hospital settings where most donors are replacement donors [4,5,11]. This study was conducted to ascertain the socioeconomic factors that could facilitate the retention of VNRD in a regional centre of National Blood Service setting where all the donors donate voluntarily with a view to first identify those associated factors as well as to strengthen the donor drive strategy and influence the nation's policy on voluntary blood donation.

MATERIALS AND METHODS

Study design and setting

The influence of socioeconomic status of voluntary blood donors on retention of blood donors was analyzed using a cross-sectional study design. VNRD that presented at the south west zonal centre of National Blood Service Commission during the 2022 world blood donor day for blood donation were the respondents. This survey was carried out to identify if socioeconomic status of VNRD determines blood donor retention.

Ibadan is the capital and most populous city of Oyo state, in Nigeria. It is the second largest city in terms of population in the south western Nigeria after Lagos. It is the largest city by total surface area in Nigeria. It is located on seven hills, rich in cultural heritage and interesting history. It is the home of first television station and first university in Nigeria.

Study population and sample size

All voluntary non remunerated blood donors who presented for the voluntary blood donation drives at the 2022 annual world blood donor day and who consented constituted the study population.

Ethical consideration

Approval was obtained from the headquarters of National Blood Service Commission as part of Ibadan survey on voluntary blood donor. 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 voluntary blood donors are aware of the annual world blood

donors' day and were also informed of the modality of the blood donor drive through an awareness rally conducted within Ibadan metropolis. Interviewer-administered standard questionnaires were used to obtain data. The questionnaire contained sections on sociodemographic (age and gender), economic status, 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, 450 ml's 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), International Business Machine (IBM) (IBM) version 25. Continuous variables (age, weight, and hemoglobin) 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's chi-squared test or Fisher's exact test where applicable. All tests were two-sided, and statistical significance was considered to be at a probability value of $p<0.05$.

RESULTS

Sociodemographic and socioeconomic characteristics of the respondents

Two hundred and fifty-one voluntary non-remunerated blood donors participated in this study. The mean age of these donors was 30.9 ± 11.5 years and majority (43%) falls in the age group 21 years-30 years (Figure 1).
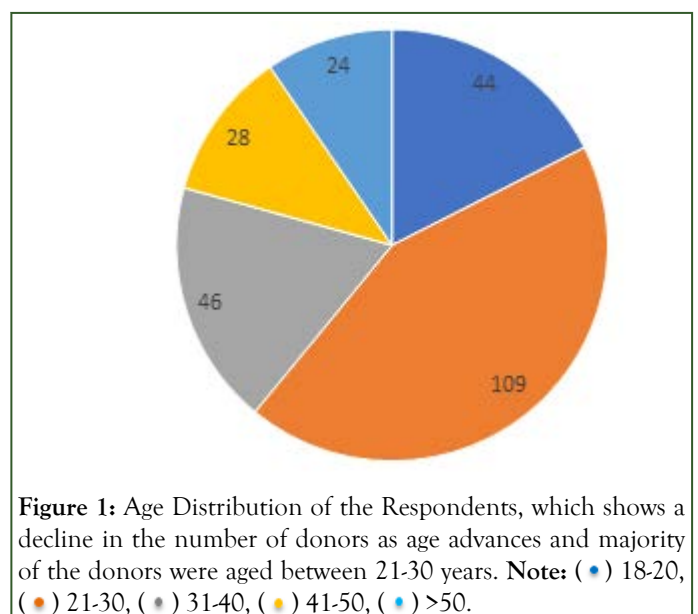
Figure 1: Age Distribution of the Respondents, which shows a decline in the number of donors as age advances and majority of the donors were aged between 21-30 years. **Note:** (•) 18-20, (•) 21-30, (•) 31-40, (•) 41-50, (•) >50.

About three-quarters of the donors were males (72%) and single (61%). Majority (84%) of the donors reside in urban centre while a minority (15%) had at most secondary school education.

The average monthly income of the donors was 50,000 naira ($100) (Table 1).

Table 1: Sociodemographic and economic characteristics of respondents.

Variable	Frequency (%)
Age	
Mean 30.9 ± 11.5 years	
Male 31.0 ± 10.6 years	
Female 30.5 ± 13.6 years	
Gender (n=251)	
Male	183 (72.9)
Female	68 (27.1)
Marital status (n=251)	
Single	153 (61.0)
Married	98 (39.0)
Residence (n=251)	
Urban	211(84.1)
Rural	16 (6.3)
Semi-urban	24 (9.6)
Tribe	
Yoruba	228 (90.8)
Igbo	15 (6.0)
Others	8 (3.2)
Educational level (n=251)	
Secondary and below	38 (15.1)
Tertiary	213 (84.9)
Income per month in ×1000 Naira (n=159)	
1-50(<$100)	91 (57.3)
51-100($102-$200)	36 (22.6)
101-150($202-$300)	15 (9.4)
>150(≥ $300)	17 (10.7)

Note: The above table shows the sociodemographic characteristics of the respondents. There was no significant difference in the mean age according to gender.

Blood donation practice

One hundred and sixty-three respondents (64.9%) had donated before with number of donations ranging from one to forty. Most respondents (63.8%) had donated between one to ten times while only a small proportion (2.5%) had donated 31 to 40 times (Figure 2).
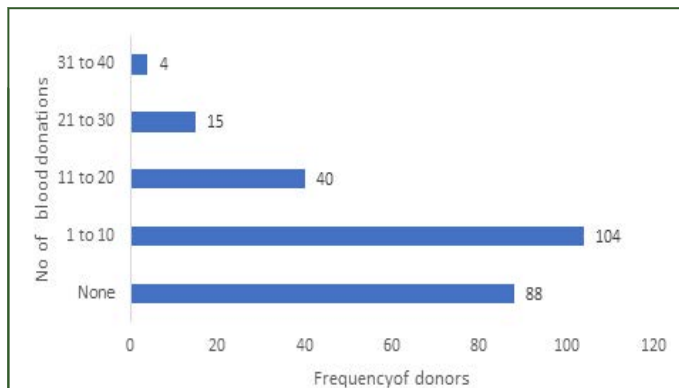
Figure 2: Previous donations of the respondents which reveal that most of the donors had donated only between 1-10 times.

About half of the respondents (49.4%) had donated within one year to this study, male: female ratio of 6.3:1. Among the males and females, only a small proportion of the respondents (16% vs. 17.6%) had donated four and three times respectively in the last one year, more males than females donated across different the various categories (Figure 3).
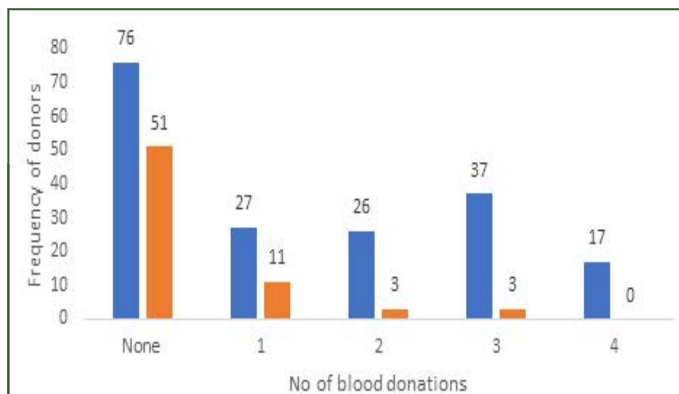
Figure 3: Gender distribution of previous blood donation. **Note:** None: First time donors, 1: 1-10 times donation, 2: 11-20 times donation, 3: 21-30 times donation, 4: 31-40 times donors (■) Male, (■) Female.

Association between previous donations and socioeconomic characteristics

A chi square test of independence was performed to examine relationship between previous donations and educational level, monthly income, age of respondents, place of residence, gender and number of donations in the last one year. There is a significant relationship between educational level ($x^2(1$, n=251)=6.04, p=0.014), age of respondents ($x^2(4$, n=251)=87.04, p=0.0001) and Gender ($x^2(1$, n=251)=31.27, p=0.0001) (Table 2).

Table 2: Association between previously donated respondents and socioeconomic characteristics.

	Previous donation					
	Yes Frequency (%)	No Frequency (%)	X^2	Df	p-value	Ph
Educational level						
Secondary and below	32(84.4)	6(`5.8)	6.04	1	0.014*	0.15
Tertiary	136(63.8)	77(36.2)				
Monthly income (x1000 N)						
0-50 (<$100)	64(70.3)	27(29.7)	5.1	3	0.163	0.18
51-100 ($102-$200)	31(86.1)	5(13.9)				
101-150 ($202-$300)	11(73.3)	4(26.7)				
≥ 151(≥ $300)	15(88.2)	2(11.8)				
Age(years)						
18-20	4(9.1)	40(90.9)	87.04	4	0.000**	0.59
21-30	78(71.6)	31(28.4)				
31-40	41(89.1)	5(10.9)				
41-50	25(89.3)	3(10.7)				
≥ 51	20(83.3)	4(16.7)				
Place of residence						
Urban	140(66.4)	71(33.6)	1.7	2	0.453	0.08
Rural	13(81.3)	3(18.7)				
Semi-urban	15(62.5)	4(37.5)				
Gender						
Male	141(77.0)	42(23.0)	31.27	1	0.000**	0.35
Female	27(39.7)	41(60.3)				
No of donation in last one year						
0	3(100)	0(0)				
1	38(100)	0(0)	3.41	4	0.492	0.16

2	23(96.6)	1(3.3)
3	40(100)	0(0)
4	17(100)	0(0)

Note: *Statistical significance $p<0.05$, ** Statistical significance $p<0.001$, Chi-square analysis, Pearson correlation.
The above table shows the relationship previous blood donation and socioeconomic characteristics of the respondents. Age, gender and educational status were significantly associated with previous blood donation.

Predictors of blood donation

Multiple regressions were used to examine the predictor of previous blood donation. We tested if age, gender, level of education, number of donations in the previous year and monthly income significantly predicted previous blood donation. The results indicated three predictors explained 39.7% of the variance (R^2=39.7, F (3,88)=19.4). It was found out that number of donations in the previous year significantly predicted previous blood donation in a donor's lifetime (β=7.2, p=0.001) as did age (β=0.4, p=0.008) and educational level (β=7.2, p=0.017).

DISCUSSION

Availability of safe blood in developing countries is still substantially low compared to the transfusion demands. In this study, we set out to determine the socio-economic factors that influence voluntary non- remunerated blood donation in South Western, Nigeria. The main finding of this study indicates that having tertiary education is an important predictor of being a voluntary donor. This is because having formal education brightens individual's altruistic perspective. This finding is similar to previous work done by Shilpa Bhimalli, et al. who reported that voluntary blood donation could be influenced to a great extent by the level of education in the general population and Elena Zito, et al. who also reported the importance of education as a motivation in voluntary blood donation [12,13]. This is however contrary to Benedict Nwogoh, et al. who reported that there is no significant association between blood donation and level of education in a study done among health care workers in south southern, Nigeria [3]. They opined that, educating prospective donors and actual donors would go a long way in donor retention as shown by Immaculata Uwe et al., [14].

Another important finding in this study is that majority of the donors are aged 21 to 30 years, this is because this group of individuals are more accessible in voluntary blood donation drive efforts through jingles, roadshows and social media campaigns. This finding is similar to previous work done by Aworanti et al, Olawumi and Adewuyi, Fasola et al where the age range between 18 and 34 years [11,15,16]. This shows that current efforts at recruitment of voluntary blood donors may be focused on this age group and therefore there is urgent need to develop strategies that could reach and attract voluntary blood donation outside this age range, to include artisans, market women, professionals and older generation [17].

This study also found out that voluntary non remunerated blood donors who donated consistently over the preceding one year had the highest number of donations. We opined that encouraging regular blood donations over a period of at least one year in first timer and non-regular voluntary blood donors could engender retention of the donors. Donor retention is a challenge in Africa this is as reported by Susanne Mbaka Ngunza et al where donor retention was said to be about 24%. It was also reported that ensuring a consistent and regular donation by a donor could lead to donor retention.

CONCLUSION

In conclusion, attaining tertiary educational level and regular voluntary non-remunerated blood donation for at least one year are important positive predictors for blood donor retention which should be encouraged in our society.

DECLARATIONS

Ethical approval and consent to participate

Approval was obtained from the ethics committee of headquarters of National Blood Service Commission as part of Ibadan survey on voluntary blood donor. Informed consent was obtained from all the participants. The study was conducted in accordance with the ethical principles of the Helsinki declaration. 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.

Conflicts of interest

No potential conflict of interest was reported by the author(s).

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Data sharing policy

The data that support the findings of this study are available on request from the corresponding author, Dr. Oladapo Wale Aworanti. The data are not publicly available due to restrictions e.g. their containing information that could compromise the privacy of respondents

Authors' contribution

REFERENCES

1. World Health Organization. Towards 100% voluntary blood donation: a global framework for action. Geneva: World Health Organization. 2010.

2. Nwogoh B, Aigberadion U, Nwannadi A. Knowledge, attitude and practice of voluntary blood donation among healthcare worker at the University of Benin teaching hospital, Benin city, Nigeria. J Blood Transfus. 2013; 797830.

3. National Blood Transfusion Service. Federal Ministry of Health, Nigeria. Nigeria National Blood Policy Revised. Abuja: National Blood Transfusion Science. Federal Ministry of Health. 2006.

4. Ahmed SG, Hassan AW, Obi SO. The pattern of blood donations in North East Nigeria. Nig J Surg Res. 1999; 1: 76–81.

5. Bartonjo G, Oundo J, Nganga Z. Prevalence and associated risk factors of transfusion transmissible infections among blood donors at Regional Blood Transfusion Center Nakuru and Tenwek Mission Hospital, Kenya. Pan Afr Med J. 2019; 34: 31.

6. Ogundeji SP, Ajayi OD, Busari OE, Ogundeji OA, Adepoju OA, Esan FGJ. Knowledge, attitude and perception towards voluntary blood donation among university students in Nigeria. ISBT Sci ser. 2021; 18: 85-91.

7. Ugwu AO, Madu AJ, Efobi CC, Ibegbulam OG. Pattern of blood donation and characteristics of blood donors in Enugu, Southeast Nigeria. Niger J. Clin Pract. 2018; 21:1438-1443.

8. Umeora OUJ, Onuh SO, Umeora MC. Sociocultural barriers to voluntary blood donation for obstetric use in rural Nigerian village. Afr J Reprod Health. 2005; 9:72-76.

9. Asamoah-Akuoko L, Hassall OW, Bates I, Ullum H. Blood donors perception, motivation and deterrents in Sub-Saharan Africa-a coping view of evidence. B J Haem. 2011; 177: 864-877.

10. Aregash M, Belay E. Blood donation intentions and predictors among hosanna town dwellers, South nation nationality people's region, Ethiopia. J Family Med Pri Care. 2022; 11: 5320-5326.

11. Aworanti OW, Ogundeji SP, Oladele AQ, Okojie EA. Comparative analysis of blood donation practices among students at Nigerian University. OJMR. 2022;3: 42-49.

12. Bhimalli S, Sachin GJ, Ahmed MM. A Prospective study on impact of education on knowledge regarding voluntary blood donation. Eur. J. of Mol Clin. Med. 2022; 9: 9833-9837.

13. Zito E, Alfieri S, Marconi M, Saturni V, Cremonesi G. Adolescents and blood donation: Motivations, hurdles and possible recruitment strategies. Blood Transfus. 2012; 10: 45-58.

14. Ugwu NI, Uneke CJ, Ugwu CN, Oti WJO, Agbo UN, Akamike IC. Effect of blood donor educational intervention on the knowledge and attitude towards voluntary blood donation among medical students at a Nigerian University. Niger Med J. 2020; 61:163-168.

15. Olawumi HO, Adewuyi JO. Blood donation trend in a tertiary hospital in Nigeria. SJMRP. 2012; 1: 1.

16. Fasola FA, Kotila TR, Akinyemi JO. Trends in transfusion transmitted viral infections from 2001 to 2006 in Ibadan. Intervirology, 2008; 51: 427-431.

17. Ngunza SM, Munyashangore C, Nshobole GN, Latine D, Anjoulat I. Low retention rate of voluntary blood donors: contribution of an original method based on a composite classification (results of a monocentric study in the Democratic Republic of Congo). Pan Afr Med J. 2020;36: 296.