

1 **PREVALENCE AND DETERMINANTS OF BLOOD DONATION AMONG STUDENTS**  
2 **OF TERTIARY INSTITUTIONS IN IMO STATE, NIGERIA.**

3

4 **Abstract**

5 **Introduction:** Safe and adequate blood donation is critical in saving millions of lives annually.  
6 In many developing including Nigeria, there is paucity of blood donors.

7 **Aim:** To assess the prevalence and determinants of blood donation among students in tertiary  
8 institutions in Imo State, South East Nigeria.

9 **Methodology:** Stratified sampling technique was used to divide the students into class strata,  
10 then systematic random sampling was used to select different respondents from each class and  
11 self-administered questionnaires were given to the respondents. Data was collated and results  
12 were analysed.

13 **Results:** Six hundred (600) undergraduates participated in the study. The mean age of the  
14 respondents was  $21.3 \pm 5.0$  years. The one year prevalence of blood donation in this study was  
15 13.8% and 63.1% of the non-donors were willing to donate. Respondents aged 15 – 29 years  
16 more willing to donate blood compared to those aged 30 – 44 years (OR = 3.03, p = 0.0003),  
17 those that were single were 4 times more willing to donate in comparison to those that were  
18 married/divorced (OR = 4.02, p < 0.0001). Respondents that were of Catholic faith were also  
19 more willing to donate compared to those that were of Pentecostal/Orthodox denomination (OR  
20 = 2.72, p = <0.0001). Class distribution and residence were not independent predictors of  
21 willingness to donate blood.

22 **Conclusion:** The prevalence of blood donation is well below willingness to donate in this study.  
23 There is need to continue to reach out to those willing to donate but do not know to go about it.

24 **Keywords:** Perception, Determinants, Blood donation, Students, Tertiary Institutions, Nigeria.

25

26 **Introduction**

27 Blood is a specialized body fluid in humans that delivers important substances such as nutrients  
28 and oxygen to the cells and transport metabolic waste products away from same cells<sup>1</sup>. Despite  
29 extensive promising research, a true substitute for blood and blood components may not be  
30 available for many years<sup>2</sup>. Therefore, blood donation is presently the major source for blood and  
31 blood components. The ancient Egyptians recognised the important properties of blood and it

32 was used to resuscitate the sick, energize the old and infirm by bathing them with it as well as  
33 being used as a tonic for the treatment of various disorders<sup>3</sup>.

34 Doctor Karl Landsteiner distinguished the main blood groups in 1901 and identified with Dr  
35 Alexander Wiener, the Rhesus factor in 1937 thus enabling blood to be transfused without  
36 endangering the patient's life<sup>4</sup>. The use of stored blood began during World War I (1914 – 1918)  
37 but the first large scale blood bank became operational in 1937 at Chicago<sup>5</sup>. A Canadian surgeon  
38 (Major L.B Robertson) serving in Canadian Army Medical Corps during the first world war was  
39 responsible for introducing transfusion in the management of war casualties to the British army.  
40 Blood transfusion was generally accepted as the treatment of choice for severe blood loss by the  
41 end of the war<sup>6</sup>. The importance of safe blood in improving health and in preventing the spread  
42 of infectious diseases cannot be underestimated. The WHO recommended that donated blood  
43 should be tested for hepatitis B surface antigen, antibody of hepatitis, antibody of HIV, usually  
44 subtype 1 and 2 as well as serologic test for syphilis<sup>7</sup>.

45 Generally, donors are classified into the following categories: voluntary donors, family  
46 replacement donors, remunerated or paid donors and autologous donors. The safest donors are  
47 found among people who donate their blood voluntarily, purely out of altruism and are self-  
48 aware of their unsuitability to serve as blood donors where there might be a slightest risk of  
49 endangering the recipients' life<sup>8,9</sup>. The risk of transfusion transmissible diseases is highest with  
50 the use of blood gotten from remunerated donors. A person in need of money is more likely to  
51 conceal his/her true state of health<sup>10,11</sup>.

52 In developing countries like Nigeria, there is dependency on family replacement and  
53 remunerated donors<sup>10,12,13</sup>. Voluntary blood donation accounts for less than 5% of blood  
54 procured in most of Nigeria blood banks<sup>10</sup>. The WHO advocates that member states should  
55 establish national blood transfusion services that will operate on the basis of voluntary, non-  
56 remunerable blood donation<sup>14</sup>. Despite the establishment of National Blood Transfusion Service  
57 (NBTS) in 2006, Nigeria has made little progress in the direction of providing sufficient blood  
58 for her teeming populace.

59 A cross-sectional study conducted to assess the knowledge and behaviour towards voluntary  
60 blood donation among students of tertiary institutions in Nigeria by Salaudeen and Odeh

61 revealed that 61% of the respondents had good knowledge of blood donation while only 15%  
62 had ever donated. Of these 15%, only 3% donated voluntarily. Males constitute 57% of those  
63 that ever donated. Many of the donors donated for friends (57%). Majority of the study  
64 participants (75%) were compelled to donate due to emergency situation. The reasons given by  
65 some respondents for not donating were lack of opportunity (45%), tight lecture schedule (24%)  
66 and inadequate knowledge (24%)<sup>15</sup>. Offiong et al in their study in Cross River State, Nigeria  
67 found that 60% of respondents had fears and misconceptions about blood donation. These  
68 included fear of fainting during donation (12%), fear of contracting HIV in the process of blood  
69 donation (65%), witchcraft initiation (10%) and religious constraints (7%)<sup>16</sup>. A study by Jacobs  
70 and Berege in Tanzania showed that of the 1141 respondents involved in the study, 26.4% had  
71 already donated blood but only 3.8% had donated voluntarily, within the previous 10 years<sup>17</sup>. A  
72 study among students of University of Dhaka, Bangladesh revealed that 82% of the participants  
73 showed a positive attitude towards blood donation. However, only 60% of the respondents in the  
74 study had actually donated voluntarily, while 93% had a negative attitude towards paid blood  
75 donation<sup>18</sup>. In Lithuania, former Soviet Union, Bucieniene et al reported that paid donors  
76 comprised 89.9%, while non-paid ones made up a paltry 10.1% of the respondents. The  
77 researchers found that 93% of the paid donors donated blood on a regular basis while only 20.6%  
78 of the non-remunerated donors donate on regular basis. The idea of remuneration necessity is  
79 supported by 78.3% of the paid donors unlike 35.3% of non-remunerated donors. An absolute  
80 majority of the paid donors (92%) think they should be offered a monetary compensation for  
81 blood donation while more than half of the non-remunerated donors (55.9%) said they would be  
82 satisfied with mere appreciation. The study also found that 28.4% of the respondents would carry  
83 on donating blood, 29.6% would do it only in emergency, another 29.6% would donate merely  
84 for their family member or friend and 12.3% would quit it completely<sup>19</sup>.

85 Among undergraduates in Greece, only 16.6% had ever donated blood. This relatively low  
86 proportion of donors is apparently due to poor knowledge about blood donation as 83.4% do not  
87 know the condition and criteria applying to blood donation in general. Also, majority of the  
88 students (63.1%) were ignorant of the social benefits from blood donation<sup>20</sup>. In the study at the  
89 Blood Centre of Umea University Hospital, Sweden, no statistically significant difference was  
90 found between male and female blood donors with respect to the general reasons and motives  
91 related to donating blood. The most common reasons for donating blood the first time were

92 influence from a friend (47.2%) and media request (23.5%). The study also reported that the  
93 most commonly reported motives for donating blood was general altruism (40.3%), social  
94 responsibility/obligation (19.7%) and influence from friends (17.9%). General altruism (68.4%)  
95 and social responsibility/obligation (16.0%) were also the most frequent reasons for continuing  
96 to donate blood. The most commonly reported obstacle to becoming a regular blood donor was  
97 laziness (19.1%) followed by fear of needles (10.5%)<sup>21</sup>. A study conducted by Wanitkit among  
98 students of Chula Long Kom University in Thailand showed that 80% of participants knew about  
99 blood donation while only 11% had ever donated blood voluntarily. Fear of getting infection was  
100 the commonest inhibiting factor among non- donors<sup>22</sup>. A study by Sampath et al in Trinidad and  
101 Tobago reported that 81.2% of the respondents had never donated blood and of the 18.8% who  
102 had previously donated, replacement for a family member or friend was the overwhelming  
103 reason (86.9%)<sup>23</sup>. A Nigerian study by Nwabueze et al reported that the commonest motivating  
104 factors towards blood donation by medical and pharmaceutical students of a south eastern  
105 institution was to save a friend or family member while fear of infections was cited as the  
106 commonest reason for refusing to donate blood<sup>24</sup>.

107 Nigeria has a very young population with median age of 18.4 years in 2017<sup>25</sup>. Therefore,  
108 motivating healthy young population toward voluntary blood donation is of utmost importance  
109 and may substantially narrow the gap between demand and supply of blood. In this study, we  
110 explored those factors that motivate and inhibit young and educated sector of our society from  
111 donating blood and assess the level of willingness to donate blood among them so as to help  
112 concerned agencies, both private and government, to plan accordingly and increase the  
113 proportion of voluntary donation in our blood supplies.

114

115

## 116 **Methodology**

117 Imo state is one of the 36 states in Nigeria located in the South Eastern part of the country. It has  
118 27 local government areas with 5 being urban and 22 being rural. The State covers an area of  
119 5100 square kilometre with a population density varying from 230 to 1400 persons per square  
120 kilometre.<sup>26</sup> There are several government owned institutions of higher learning in the state  
121 which includes: Imo State University, Owerri; Federal University of Technology, Owerri;

**Comment [U1]:** Not place references in this sector, I mean the numbers: 26, 15 and 24. Make the comment with the reference number in introduction.

122 Federal Polytechnic, Nekede; Eastern Palm University, Ogboko; Imo State Polytechnic,  
123 Umuagwo; Alvan Ikoku College of Education, Owerri; Imo State Technological Skills  
124 Acquisition Institute, Orlu; College of Health Science and Technology, Amaigbo, Nwangele;  
125 School of Nursing, Amaimo and Imo State College of Nursing and Health Sciences, Orlu.

126 A cross – sectional descriptive study was carried out among full time undergraduates of Imo  
127 State University Owerri and Alvan Ikoku Federal College of Education, Owerri.

128 Sample size was calculated using the Cochran formula for single proportion in study populations  
129 greater than 10,000;<sup>15</sup>.

$$130 \quad n = Z^2 P (1 - P) / d^2,$$

131 Where n is the minimum sample size, Z is the standard normal deviate at 95% confidence  
132 interval (1.96), P is the proportion of undergraduates that had ever donated blood from a  
133 previous study (0.60)<sup>24</sup> and d is the level of precision required, set at 0.05. The calculated  
134 minimum sample size was 369. Considering a potential non-response rate of 10%, the minimum  
135 sample size required for this study was 406; however, 600 students were enrolled in this study.

136 A multi-stage sampling technique was employed in selecting the participants for this study. The  
137 first stage involved stratification of schools into universities and non-universities higher  
138 institutions using list of higher institutions in Imo State as sampling frame. The second involved  
139 the selection of Imo State University from the university institutions and Alvan Ikoku College of  
140 Education from the non-university higher institutions using simple random sampling by  
141 balloting. In the third stage, study participants were proportionately allocated to the two  
142 institutions using the information obtained from their student affairs departments. The number of  
143 respondents in each institution was proportionately allocated to the departments and to the study  
144 levels of the students using the sampling frame obtained from Heads of departments. Systematic  
145 sampling technique was then used to select respondents. The respondents that were not available  
146 during the survey were replaced by the next person in the sampling frame.

147 A pretested, self-administered structured questionnaire was used to collect data from study  
148 participants between first week of August and last week of October 2017. The questionnaire  
149 comprised 4 sections containing the demographic characteristics, awareness and knowledge

150 regarding blood donation; attitude towards blood donation and factors affecting willingness to  
151 donate blood.

152 Ethical approval for this study was obtained from Imo State University Teaching Hospital  
153 (IMSUTH) Ethical Committee. The study was done in line with ethical procedures as outlined in  
154 Helsinki declaration of 1964.

## 155 **Results**

### 156 **Sociodemographic characteristics of respondents**

157 Six hundred (600) questionnaires were distributed for this study and all were duly filled and  
158 returned. Female respondents were 416 (69.3%). The mean age of the respondents was  $21.3 \pm$   
159  $5.0$  years with 318(53.0%) being within 20 – 24 years age bracket.

160 Majority of the study participants 538(89.1%) were single and a higher proportion 231(38.5%)  
161 were in their second year of study. Social sciences, humanities and education contributed  
162 421(70.2%) respondents and Catholics 359(59.8%) and Pentecostals 131(21.8%) were the  
163 dominant religious denomination. Majority of the study participants 336(56.0%) live off campus  
164 and belong to a religious organisation 395(65.8%).

165 **Table 1: Sociodemographic characteristics of respondents**

166 <b>Variable</b>	<b>Frequency (n = 600)</b>	<b>Percent</b>
167		
168 <b>Gender</b>		
169 Female	416	69.3
170 Male	184	30.7
171 <b>Age group (years)</b>		
172 15 – 19	108	18.0
173 20 – 24	318	53.0

**Comment [U2]:** Throughout this sector: Tables are too long. Must to find a way to summarize to make reading and comprehension easier. Complete the explanatory text with the number of the table to which it refers.

174	25 – 29	114	19.0
175	30 – 34	37	6.1
176	35 – 39	15	2.5
177	40 – 44	8	1.3
178	<b>Mean ± SD</b>	21.3 ± 5.0	
179	<b>Marital status</b>		
180	Single	538	89.7
181	Married	60	10.0
182	Divorced	2	0.3
183	<b>Level of study</b>		
184	100 level	51	8.5
185	200 level	231	38.5
186	300 level	133	22.2
187	≥400 level	185	30.8
188	<b>Faculty</b>		
189	Social sciences	156	26.0
190	Humanities	138	23.0
191	Education	127	21.2
192	Medical science	97	16.1
193	Pure science	82	13.7
194	<b>Religious denomination</b>		

195	Catholic	359	59.8
196	Pentecostal	131	21.8
197	Orthodox	94	15.7
198	Jehovah witness	10	1.7
199	Traditionalist	5	0.8
200	Islam	1	0.2
201	<b>Tribe</b>		
202	Igbo	556	92.7
203	Yoruba	29	4.8
204	Hausa	5	0.8
205	Others*	10	1.7
206	<b>Residence</b>		
207	Hostel	183	30.5
208	Off campus	336	56.0
209	Living with family	81	13.5
210	<b>Membership of religious organisation</b>		
211	Yes	395	65.8
212	No	205	34.2

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213 \*Ikwerre, Urhobo, Efiks, Ijaw.

214 **Awareness of respondents about blood donation**



215 Most of the respondents 549(91.5%) were aware of blood donation and of these, 517(94.2%)  
216 knew about voluntary blood donation. Major sources of information on blood donation were  
217 electronic media 404(73.6%), school colleagues and lecturers 395(71.9%), health workers  
218 348(63.4%) and the print media 337(61.4%).

219 Almost all the respondents knew about their blood group 558(93.0%) and the commonest blood  
220 group was O+ve 298(42.3%), closely followed by A+ve 217(38.9%).

221 **Table 2: Awareness of respondents about blood donation**

222	<b>Variable</b>	<b>Frequency</b>	<b>Percent</b>
223	<b>Aware of blood donation (n = 600)</b>		
224	Yes	549	91.5
225	No	51	8.5
226	<b>Types of blood donor known (n = 549)**</b>		
227	Voluntary donors	517	94.2
228	Non-voluntary/paid donors	150	27.3
229	Family replacement donors	33	6.0
230	<b>Source of information (n = 549)**</b>		
231	Electronic media	404	73.6
232	School mates/lecturers	395	71.9
233	Health workers	348	63.4
234	Print media	337	61.4
235	Parents/relatives	154	28.1
236	Internet	106	19.3

237 **Blood group awareness (n = 600)**

238	Yes	558	93.0
239	No	42	7.0

240 **Blood group of respondents (n = 558)**

241	A <sup>+</sup>	217	38.9
242	B <sup>+</sup>	51	9.1
243	AB	15	2.7
244	O <sup>+</sup>	298	42.3
245	O <sup>-</sup>	35	6.3
246	Others (A <sup>-</sup> , B <sup>-</sup> )	4	0.7

247 **\*\* Multiple responses applicable.**

248

249 **Prevalence and reasons for blood donation among respondents**

250 Only 83(13.8%) respondents donated blood in the one year period preceding the study with 40 of  
251 them (48.2%) donating to a family member. The main reason given by respondents for donating  
252 blood was to save live in an emergency situation (62.7%) while lack of opportunity to donate  
253 (35.4%) was the commonest reason given by those who have not donated in the past one year.  
254 However, 326(63.1%) of these set of respondents are positively inclined to blood donation.

255 **Table 3: Prevalence and reasons for blood donation among respondents**

256	Variable	Frequency	Percent
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257 **Donated blood in the last one year (n=600)**

258	Yes	83	13.8
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259	No	517	86.2
260	<b>Recipient of blood (n = 83)</b>		
261	Family member	40	48.2
262	Unknown persons	23	27.7
263	Friends	20	24.1
264	<b>Main reason for donating blood (n = 83)</b>		
265	Emergency situation to save live	52	62.7
266	Free will donation	23	27.7
267	Organizational activity	6	7.2
268	Due to incentive given	2	2.4
269	<b>Main reason for not donating (n = 517)</b>		
270	Lack of opportunity to donate blood	183	35.4
271	No reason	138	26.7
272	Anxiety	64	12.4
273	Ignorance	45	8.7
274	Fear of contacting infection	38	7.4
275	Fear of needle	27	5.2
276	Religious/Cultural beliefs	22	4.3
277	<b>Willingness to donate blood (n = 517)</b>		
278	Yes	326	63.1
279	No	120	23.2

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280 Not sure 71 13.7

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281

282 **Association between sociodemographic variables of respondents and having donated blood**  
283 **in the last one year.**

284 No sociodemographic variable was found to be significantly associated with blood donation in  
285 the last one year. However, slightly higher proportion of males (16.8%) donated compared to the  
286 females (12.5%). Also, respondents within the age group 25 – 29 years had the highest  
287 proportion of blood donation (18.4%) in comparison to the other age groups.

288 **Table 4: Association between sociodemographic variables of respondents and having**  
289 **donated blood in the last one year.**

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290 Variable	291 Donated blood in the last one year		$\chi^2$	p-value
	292 Yes (%) n = 83	No (%) n = 517		
293 <b>Gender</b>				
294 Female	52 (12.5)	364 (87.5)	2.02	0.155
295 Male	31 (16.8)	153 (83.2)		
296 <b>Age group (years)</b>				
297 15 – 19	14 (13.0)	94 (87.0)	3.13	0.680
298 20 – 24	42 (13.3)	276 (86.8)		
299 25 – 29	21 (18.4)	93 (81.6)		
300 30 – 34	4 (10.8)	33 (89.2)		
301 35 – 39	1 (6.7)	14 (93.3)		
302 40 – 44	1 (12.5)	7 (87.5)		

303	<b>Marital status</b>				
304	Single	79 (14.7)	459 (85.3)	4.05	0.256
305	Married	4 (6.7)	56 (93.3)		
306	Divorced	0 (0.0)	2 (100.0)		
307	<b>Class distribution</b>				
308	100 level	9 (17.6)	42 (82.4)	1.30	0.728
309	200 level	28 (12.1)	203 (87.9)		
310	300 level	19 (14.3)	114 (88.7)		
311	≥ 400 level	27 (14.6)	158 (85.4)		
312	<b>Faculty</b>				
313	Social science	17 (10.9)	139 (89.1)	8.62	0.071
314	Humanities	13 (9.4)	125 (90.6)		
315	Education	23 (18.1)	104 (81.9)		
316	Medical sciences	13 (13.4)	84 (86.6)		
317	Pure science	17 (20.7)	65 (79.3)		
318	<b>Religious denomination</b>				
319	Catholic	53 (14.8)	306 (85.2)	4.72	0.451
320	Pentecostal	14 (10.7)	117 (89.3)		
321	Orthodox	16 (17.0)	78 (83.0)		
322	Jehovah witness	0 (0.0)	10 (100.0)		
323	Traditionalist	0 (0.0)	5 (100.0)		

324	Islam	0 (0.0)	1 (100.0)		
325	<b>Tribe</b>				
326	Igbo	73 (13.1)	483 (86.9)	5.24	0.155
327	Yoruba	8 (27.6)	21 (72.4)		
328	Hausa	1 (20.0)	4 (80.0)		
329	Others	2 (20.0)	8 (80.0)		
330	<b>Residence</b>				
331	Hostel	22 (12.0)	161 (88.0)	4.14	0.126
332	Off campus	44 (13.1)	292 (86.9)		
333	Living with family	17 (21.0)	64 (79.0)		
334	<b>Membership of religious organizations</b>				
335	Yes	61 (15.4)	334 (84.6)	2.51	0.113
336	No	22 (10.7)	183 (89.3)	\	

337

338 **Association between sociodemographic characteristics and willingness to donate blood**

339 Age group ( $\chi^2 = 23.4$ ,  $p = 0.009$ ), marital status ( $\chi^2 = 25.7$ ,  $p = 0.000$ ), class distribution ( $\chi^2 =$   
340  $30.6$ ,  $p = 0.000$ ), religious denomination ( $\chi^2 = 65.5$ ,  $p = 0.000$ ), and residence ( $\chi^2 = 33.6$ ,  $p =$   
341  $0.000$ ) were significantly associated with willingness to donate blood.

342 Respondents aged 25 – 29 years were the most willing (72.8%) to donate blood followed by  
343 those in the age group 20 – 24 years. Likewise, those that were single (66.9%) were more willing  
344 to donate compared to the others. Study participants in 100 level (22.9%) were less willing to  
345 donate blood compared to those in 200 level and above. Also, those living within the campus  
346 were more willing to donate blood (70.6%) compared to those staying off campus (65.2%).

347 **Table 5: Association between sociodemographic characteristics and willingness to donate**  
 348 **blood**

349 Variable	350 Willingness to donate blood			$\chi^2$	p-value
	Yes (%)	No (%)	Unsure (%)		
351	n = 326	n = 120	n = 71		
352 <b>Gender</b>					
353 Female	238 (65.7)	76 (21.0)	48 (13.3)	4.14	0.126
354 Male	88 (56.8)	44 (28.4)	23 (14.8)		
355 <b>Age group (years)</b>					
356 15 – 19	56 (60.2)	25 (26.9)	12 (12.9)	23.4	0.009
357 20 – 24	169 (64.5)	50 (19.1)	43 (16.4)		
358 25 – 29	75 (72.8)	20 (19.4)	8 (7.8)		
359 30 – 34	17 (50.0)	13 (38.2)	4 (11.8)		
360 35 – 39	6 (37.5)	8 (50.0)	2 (12.5)		
361 40 – 44	3 (33.3)	4 (44.4)	2 (22.2)		
362 <b>Marital status</b>					
363 Single	301(66.9)	92 (20.4)	57 (12.7)	25.7	0.000
364 Married	24(37.5)	27 (42.2)	13(20.3)		
365 Divorced	1(33.3)	1(33.3)	1(33.3)		
366 <b>Class distribution</b>					
367 100 level	12 (27.9)	22 (51.2)	9 (20.9)	30.6	0.000

368	200 level	150 (70.1)	42 (19.6)	22 (10.3)		
369	300 level	66 (60.6)	25 (22.9)	18 (16.5)		
370	≥ 400 level	98 (64.9)	31(20.5)	22 (14.6)		
371	<b>Faculty</b>					
372	Social sciences	96 (67.1)	30 (21.0)	17 (11.9)	5.39	0.715
373	Humanities	75 (62.5)	29 (24.2)	16 (13.3)		
374	Education	63 (61.2)	23 (22.3)	17 (16.5)		
375	Medical sciences	47 (55.3)	23 (27.1)	15 (17.4)		
376	Natural sciences	45 (68.2)	15 (22.7)	6 (9.1)		
377	<b>Religious denomination</b>					
378	Catholic	237 (71.4)	53 (16.0)	42 (12.7)	65.5	0.000
379	Pentecostal	51(58.0)	20 (22.7)	17 (19.3)		
380	Orthodox	37 (46.8)	34 (43.0)	8 (10.1)		
381	Jehovah witness	0 (0.0)	9 (81.8)	2 (18.2)		
382	Traditionalist	0 (0.0)	4 (66.7)	2 (33.3)		
383	Islam	1(100.0)	0 (0.0)	0 (0.0)		
384	<b>Residence</b>					
385	Hostel	125 (70.6)	43 (24.3)	9 (5.1)	33.6	0.000
386	Off campus	161(65.2)	50 (20.2)	36 (14.6)		
387	Living with family	40 (43.0)	27 (29.0)	26 (28.0)		
388	<b>Membership of religious organizations</b>					



389	Yes	213 (61.9)	77 (22.4)	54 (15.7)	3.40	0.182
390	No	113 (65.3)	43 (24.9)	17 (9.8)		

391

392 **Predictors of willingness to donate blood among the respondents**

393 On bivariate analysis, respondents aged 15 – 29 years were about 3 times more willing to  
 394 donate blood compared to those aged 30 – 44 years (OR = 3.03, p = 0.0003). With respect to  
 395 marital status, single respondents were 4 times more willing to donate blood in comparison to  
 396 married/divorced respondents (OR = 4.02, p < 0.0001). The study also revealed that  
 397 undergraduates that were of the Catholic faith were more willing to donate blood when compared  
 398 to their counterparts that were of Pentecostal/Orthodox denomination (OR = 2.72, p < 0.0001).  
 399 Level of study and nature of residence were not independent predictors of willingness to donate  
 400 blood. Table 6.

401 **Table 6: Predictors of willingness to donate blood among the respondents**

402	Variable	OR (estimate)	95% (CI)	p-value
403	<b>Age group</b>			
404	15 – 29	3.03	1.67 – 5.51	0.0003
405	30 – 44	1.00		
406	<b>Marital status</b>			
407	Single	4.02	2.18 – 7.39	<0.0001
408	Married/Divorced	1.00		
409	<b>Class distribution</b>			
410	≤ 200 level	1.00		
411	≥ 300 level	1.16	0.76 – 1.76	0.496

412 **Religious denomination**

413	Catholic	2.72	1.75 – 4.31	<0.0001
414	Pentecostal/Orthodox	1.00		

415 **Residence**

416	Hostel	1.00		
417	Off campus	0.90	0.58 – 1.39	0.628

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418 **Respondents that were unsure of their willingness to donate blood were excluded from this**  
419 **analysis.**

420 **Discussion**

421 The mean age of undergraduates in this study was  $21.3 \pm 5$  years. This is similar to that observed  
422 by Duru et al (22.5 years) and Onofa et al (23.9 years) in their publications on psychoactive  
423 substance use among students of tertiary institutions<sup>27,28</sup>. According to the World Health  
424 Organisation (WHO), the age profile of blood donors shows that proportionally more young  
425 people donate blood in low and middle income countries such as Nigeria than in high income  
426 countries<sup>29</sup>. Though, there are more female respondents in this study (69.3%) in keeping with the  
427 trend in many institutions of higher learning in Nigeria<sup>30</sup>, data about the gender profile of blood  
428 donors show that globally, 70% of blood donation are given by men<sup>29</sup>. Demographic information  
429 of blood donors is important for formulating and monitoring recruitment strategies.

430 On the awareness and knowledge about blood donation, most of the respondents (91.5%) knew  
431 about blood donation. This is in consonance with 95.6% and 93.2% reported among medical and  
432 pharmacy students respectively in a study by Nwabueze et al at Nnamdi Azikiwe University,  
433 Awka in Anambra state, South Eastern Nigeria<sup>24</sup>. The observation that electronic media is the  
434 most prominent way people gather information about blood donation was consistent with results  
435 from a study conducted in India on knowledge, attitude and practices of people towards  
436 voluntary blood donation in Uttarakhand, India<sup>31</sup>. Using the social media to disseminate  
437 information on the importance and benefit of blood donation may yield better dividends given its  
438 popularity among young people.

439 In the index study, 93.0% of the respondents knew their blood group. This is similar to the  
440 93.9% reported among health workers in Benin, Edo State<sup>32</sup> and 95.2% observed among  
441 pharmacy students in Awka, Anambra State<sup>24</sup>. A lower figure of 69.5% was reported by Amatya  
442 in Nepal<sup>33</sup>. The commonest blood group of respondents in this study is O+ve (42.3%) followed  
443 by A+ve (38.9%). This is similar to what was reported by Nwagoh et al, in Benin city, Nigeria.  
444 The proportion of O+ve and A+ve in Nwagoh's study was 45.4% and 15.3% respectively,  
445 though they reported a high non response rate of 21.5%<sup>32</sup>. The public health importance of this  
446 finding is that majority of the populace are universal donors and this fact should be made known  
447 to the general public.

448 The knowledge and attitude of respondents towards blood donation in this study was satisfactory.  
449 However, this contradicts the actual practice of blood donation as only 13.8% of the respondents  
450 had donated blood in the last one year and most times, the donation is for a family member in an  
451 emergency situation. Other workers have reported that good knowledge and attitude do not  
452 usually translate to the actual practice of blood donation<sup>24,32</sup>.

453 Surprisingly, majority of respondents (35.4%) in the index study gave lack of opportunity to  
454 donate blood as their main reason for not donating. Likewise, a study in Benin city, Nigeria  
455 reported that the commonest reason given by respondents for not donating blood was because no  
456 one had ever approached them to donate<sup>32</sup>. Other studies reported fear of infection as the  
457 commonest reason for refusing to donate blood<sup>16,24</sup>. Among non-donors in this study, 63.1%  
458 were willing to donate. This buttressed the fact stated earlier that attitude towards blood donation  
459 is positive.

460 No sociodemographic variable was significantly associated with blood donation by the  
461 respondents in the last one year. However, predictors of willingness to donate include age of the  
462 respondents, their marital status and their religious inclination. Researchers in Benin City, Edo  
463 State in their study on health care workers reported a statistically significant difference between  
464 male and female donors. However, they found no association between the workers level of  
465 education and their staff category (junior and senior staff)<sup>32</sup>. Workers at the blood centre of  
466 Umee University, Sweden also found no statistically significance difference between male and  
467 female donors<sup>21</sup>.

468 **Conclusion and Recommendation**

469 This study has demonstrated that more young people are willing to donate blood if only they  
470 have the opportunity. In the light of these findings, we recommend that: Relevant government  
471 agencies and religious organizations should intensify effort at educating the populace on the  
472 importance and benefits of voluntary blood donation. Given that the media and health workers  
473 are major sources of information on blood donation, those who work in these establishments  
474 should make deliberate effort to promote voluntary blood donation as part of their corporate  
475 social responsibility. The student union governments and other organizations in tertiary  
476 institutions should include voluntary blood donation campaign as part of their activities.

477 **Authors' Contribution:** All authors participated in the conduct of this study.

478 **Conflicting Interest:** The authors hereby declare no conflict of interest

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**Comment [U3]:** Missing data in references number: 3 and 5.

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