

## Original Research Article

# Blood donation: a comparison between medical students and non-medical students

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## ABSTRACT

**Background:** Voluntary blood donation represents the main source of blood in Sudan. While students are a potential source of blood, this study aim to address the knowledge, attitudes, barriers and motives of both medical and non-medical students in order to recruit them for donating blood to meet the demands of the patients.

**Methods:** A facility based descriptive cross-sectional study was conducted at Khartoum University between January and March 2019. Structured self-administered questionnaire was used to collect data from the participants. The Data were analyzed by the Statistical Package for Social Science software version 23.

**Results:** Of the total 308 students, 75% were medical students and 25% were non-medical. Only 34 (11%) had ever donated blood. 97.1% don't donate regularly. 79.4% of the donations were voluntary. Males were significantly more donors than females (p value=000). Students had poor knowledge about blood donation requirements but demonstrated better knowledge regarding blood borne diseases. More medical students knew their blood group than non-medical students. Not being asked to be the most reported reason for not donating blood (55.1%). Most of the donors reported that a relative or a friend needs blood was their motivation factor to donate blood (64.7%).

**Conclusions:** Information about blood donation services and requirements should be available to the students. In addition, campaigns and educational sessions regarding the safety and demands of blood donation is crucial to address the fears and recruit students as eligible source of blood.

**Keywords:** Blood donation, Knowledge, Motivation, Sudan

## INTRODUCTION

The 28<sup>th</sup> world health assembly advocated for the improvement of blood transfusion services based on voluntary blood donation to guarantee sustainable blood supplies and to secure the health of donors and recipients in 1975.<sup>1</sup> Non-remunerated blood donation represents the cornerstone of safe blood in Sudan.<sup>2</sup>

At least 1% of the population should donate blood in order to meet the minimum needs of blood, this is according to the World Health Organization (WHO) recommendation.<sup>3</sup> By 112,5 million donations collected

globally, 50% were in high income countries, residence to 19% of the world population. The median annual donation per blood center is 5400 in low and middle income countries as compared to 16000 in high income countries.

The main reason behind the death during childbirth, RTA and delaying or canceling surgeries or transplants is lack of blood. In low income countries up to 65% of transfusion is to children under 5 years of age, and the donation rate based on 1000 samples is only 4.6% donations compared to 14.9% in high income countries.<sup>4</sup> Approximately 15 million whole blood products are

collected each year from voluntary non-remunerated donors. Altruism, awareness about demands, social responsibility and increase self-esteem were the major motivators of the donors. The principal reasons not to donate blood were fear, medical reasons, busy schedule, apathy and not being asked.<sup>5</sup>

Understanding the factors that underpinning people desire or rejection to donate is crucial in order to strength voluntary blood donation.<sup>1</sup> Fortunately, it is estimated that 20% of the Sudanese population in the range of 15-24 years old.<sup>2</sup> So, students of the universities would be potential donors, especially medical student because of their training and study.

### **Objectives**

The objective if this study is to assess knowledge of blood donation among medical and non-medical students, to determine motivations and barriers towards blood donation among medical and non-medical students, to determine practice of blood donation among donors and to identify attitude of blood donation.

## **METHODS**

### **Study settings**

This was facility based descriptive cross-sectional study that compares knowledge, attitude, practice, barriers and motivations between medical students and non-medical students. The study was conducted in medical and centrist campuses at the University of Khartoum, Khartoum state. January, February and March 2019

### **Data collection tools**

308 participants were randomly - proportionate stratified random sampling - selected from total population of 1336 (1000 were medical students, 336 were engineering students. 3 batches out of 6 in medicine college and 3 batches out of 5 in engineering college were randomly selected). Using systemic random sampling (interval=4) for selection of participants. Lists obtained from registers offices were used.

Data was collected using a self-structured administered questionnaire which was fostered from previous studies.<sup>2,3</sup> The questionnaire was structured after conducting a literature review, then revised and edited by a social researcher in community medicine department, Faculty of medicine, University of Khartoum.

The questionnaire composed of 19 items, printed on 3 pages, segmented into 4 sections. Socio-demographic characteristics section which was composed of 3 items. A blood donation knowledge section in which 9 items were applied to evaluate the knowledge by asking about blood donation requirements: age, weight, haemoglobin amount, blood amount, interval between donations and

asking about the blood group, donation benefits, blood borne disease and the sources of the information. In attitude and practice section 1 item was used for the attitude by asking about the importance of blood donation, and 4 items were used for practice: previous donation, frequency, type and regularity of donation among donors. And finally barriers and motivation section in which 1 item was used to assess motivations among donors and 1 item was used to assess barriers among non-donors.

Questionnaire copies were handed in person to the respondents. Codes were applied instead of names to ensure confidentiality.

### **Inclusion criteria**

Inclusion criteria includes being a medical or engineering student at University of Khartoum and should be of age  $\geq 18$  years

### **Exclusion criteria**

Those who are unwilling to participate.

### **Ethical considerations**

Written approval was taken from community medicine department, Faculty of medicine, University of Khartoum. Written authority clearances were taken from registers offices at medical and engineering college. Verbal consent was obtained from the respondents prior to data collection.

### **Data management and analysis**

Statistical Package for Social Science 23 (SPSS-23) software was used for data entry and analysis. Categorical variables were presented as frequencies and percentages, continues variable as mean and standard deviation. Logistic regression analysis and chi-square test were applied to associations testing between binary variables. P value less than 0.05 was considered significant.

## **RESULTS**

Of the total 308 students in this study, 41.2% were males (n=127) and 58.8% females (n=181).75% were medical students (n=231) and 25% were non-medical students (n=77). The mean age for the students was (20.5000, SD: 1.90234 (Table 1) (Figure 1).

### **Knowledge about blood donation**

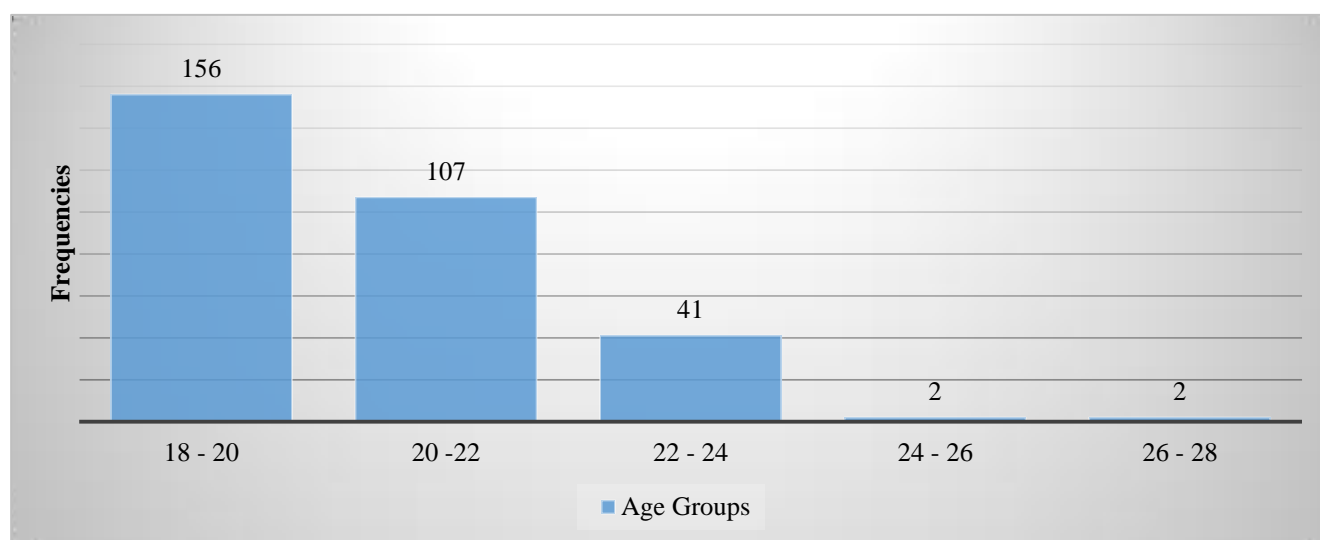
Most of the students knew their blood group (n=263, 85.4%). More medical students (89.6%) knew their blood group than non-medical students (72.7%). 93.2% of all respondents agreed that AIDS is a blood borne disease. Overall, Medical students gave more frequent correct

answers to the knowledge questions than non-medical students (Table 2). University study and “Family and friend” were the main two sources of the information for medical students and non-medical students respectively. 1.3% stated that they had the Information from healthcare

personnel in blood donation centers (Figure 2). 43.8% of students said that blood donation decrease risk of heart diseases and 52.6% think about blood donation as a free chance to blood screening.

**Table 1: Socio-demographic characteristics.**

Items	Medical students	Non-medical students	Total
	N (%)	N (%)	N (%)
<b>Respondents</b>	231 (75)	77 (25)	308
<b>Males</b>	72 (31.2)	55 (71.4)	127 (41.2)
<b>Females</b>	159 (68.8)	22 (28.6)	181 (58.8)
<b>Mean age (in years)</b>	20.3463	20.9610	20.5000



**Figure 1: Age of the respondents.**

**Table 2: Knowledge of blood donation.**

Items	Correct			Incorrect_ don't know		
	Medical students	Non-medical students	Total	Medical students	Non-medical students	Total
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
<b>Knowledge of blood donation requirements</b>						
Amount of blood that can be drawn in each donation ( $\leq 500$ ml)	49 (21.2)	6 (7.8)	55 (17.9)	182 (78.8)	71 (92.2)	253 (82.1)
Suitable age for blood donation (17-60 years)	22 (9.5)	6 (7.8)	28 (9.1)	209 (90.5)	71 (92.2)	280 (90.9)
Minimum weight for blood donation (50 kg)	59 (25.5)	15 (19.5)	74 (24)	172 (74.5)	62 (80.5)	234 (76)
Minimal interval between 2 consecutive donations (3 months)	87 (37.7)	23 (29.9)	110 (35.7)	144 (62.7)	54 (70.1)	198 (64.3)
Minimal haemoglobin amount for blood donation (12.5 mg/dl)	44 (19)	4 (5.2)	48 (15.6)	187 (81)	73 (94.8)	260 (84.4)
<b>Knowledge of blood borne diseases</b>						
AIDS	218 (94.4)	69 (89.6)	287 (93.2)	13 (5.6)	8 (10.4)	21 (6.8)
HBV	185 (80.1)	24 (31.2)	209 (67.9)	46 (19.9)	53 (68.8)	99 (32.1)
HCV	166 (71.9)	25 (32.5)	161 (92)	65 (28.1)	52 (67.5)	147 (8)
Malaria	110 (47.6)	30 (39)	140 (45.5)	121(52.4)	47 (61)	168 (54.5)
Gonorrhoea	171 (74)	67 (87)	239 (77.6)	60 (26)	10 (13)	69 (22.4)

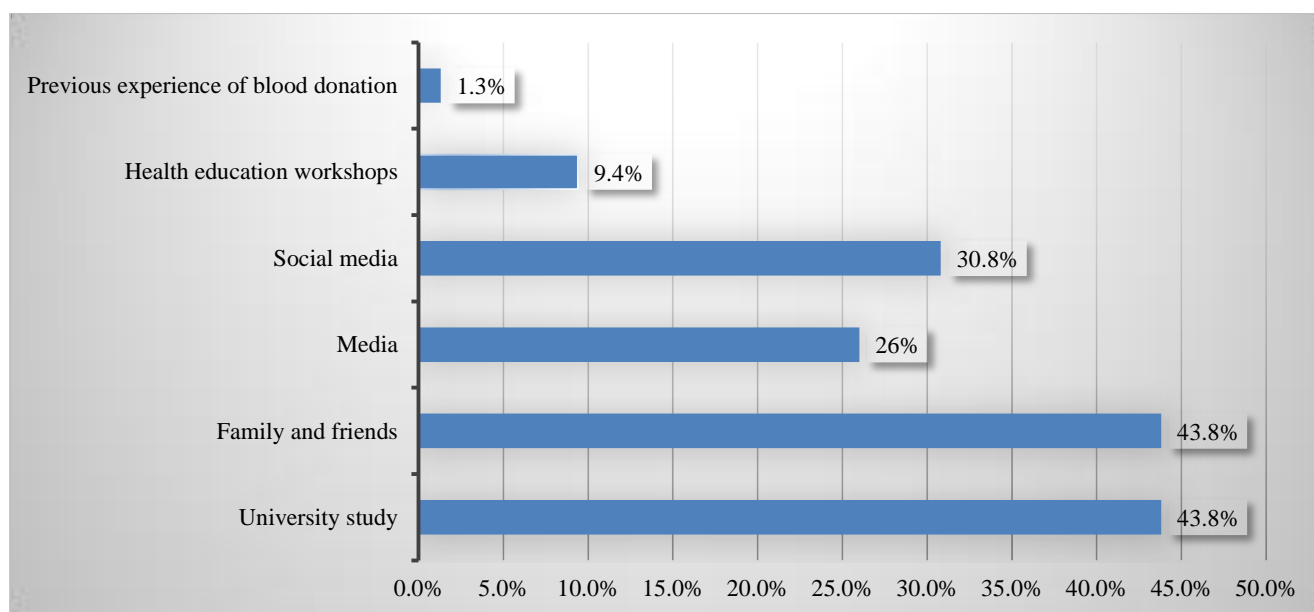


Figure 2: Sources of information about blood donation.

Table 3: Practice of blood donation among donors.

Respondents	Number of donors	Frequency		Type		Regularity	
		Once	More than once	Voluntary	For family	Yes	No
Medical students	26	16	10	22	4	1	25
Non-medical students	8	8	0	5	3	0	8
<b>Total</b>	<b>34</b>	<b>24</b>	<b>10</b>	<b>27</b>	<b>7</b>	<b>1</b>	<b>33</b>

Table 4: Motivations towards blood donation among donors.

Motivations	Medical students	Non-medical students	Total
Self-satisfaction	14 (53.8)	5 (62.5)	19 (55.9)
Relative or friend needs donation	17 (65.4)	5 (62.5)	22 (64.7)
Curiosity	6 (23.1)	3 (37.5)	9 (26.5)
Emergency situation	6 (23.1)	2 (25)	8 (23.5)
Medical reason	4 (15.4)	0	4 (11.8)

**Practice and attitude**

Only 34 (11%) of all respondents had ever donated before. Proportionately, slightly more medical respondents (11.3%) had donated than non-medical respondents (10.4%), and significantly more males (27%) than females (3.9%). Among all donors, 70.6% had donated once and 29.4% more than once. 79.4% were voluntary and 20.6% were for the family. Almost all donors (97.1%) don't donate regularly (Table 3). 242 (78.6%) of students demonstrate a positive disposition towards blood donation in the term of importance. 65 (21.1%) had a neutral opinion, and only one person didn't agree that blood donation is important.

**Motivations and barriers**

The most common motivations among donors were a family member or a friend in need (64.7%), self-

satisfaction (55.9%) and others (Table 4). Overall, Not being asked to donate blood was the most common barrier (55.1%), other reasons were medically unfit (20.8%), fear of infection (19%) and others (Table 5). Participants were allowed to choose more than one motive or barrier.

**Associations**

Gender was significantly linked to a previous donation with females being significantly fewer donors than males (P value=0.000003, OR=8.53). Non-medical students are slightly fewer donors than medical students, but this difference is not statistically significant (P value=0.066, OR=2.3) (Table 6). Significantly more medical students knew their blood group than non-medical students (P value=0.001).

**Table 5: Barriers towards blood donation among non-donors.**

Barriers	Medical students	Non-medical students	Total
Medical problem	45 (22)	12 (17.4)	57 (20.8)
Not asked to donate	112 (54.6)	39 (56.5)	151 (55.1)
No time to donate	24 (11.7)	5 (7.2)	29 (10.6)
Don't know when, where and how to donate	32 (15.6)	17 (24.6)	49 (17.9)
Parents don't allow donation	12 (5.9)	3 (4.3)	15 (5.5)
Fear of disease	31 (15.1)	6 (8.7)	37 (13.5)
Fear of injection	31 (15.1)	7 (10.1)	38 (13.9)
Fear of infection	44 (21.5)	8 (11.6)	52 (19)
Fear of weakness	13 (6.3)	3 (4.3)	16 (5.8)
Don't care	2 (1)	0	2 (0.7)
No specific reason	6 (2.9)	1 (1.4)	7 (2.6)

**Table 6: Predictors of previous donation.**

Did you donate blood before?*	P value	Exp (B) or OR	95% confidence interval for exp (B)		
			Lower bound	Upper bound	
No	Intercept	0.000			
	female	0.000	8.527	3.468	20.966
	non-medical	0.066	2.303	0.946	5.607

\*The reference category is "yes".

## DISCUSSION

Students are cornerstone part of the population that is eligible to blood donation. So, recruiting them to blood donation will give a great hand to satisfy the demands of patients. This study demonstrates low rate of blood donation 11%, which is within the range provided in the literature 10% to 60%.<sup>2</sup> The same finding was found in a similar study in Nigeria.<sup>6</sup> and a literature review in sub-Saharan African.<sup>1</sup> Noticeably, most of the donations were voluntary. Medical students have almost the same rate of donation of non-medical students, this is contradictory to what they found in a comparison study in Nepal, where medical students export lower rate of donation than non-medical students.<sup>3</sup> The results demonstrated that male donors are significantly higher than female donors.<sup>1,2,3,7</sup> Students have poor knowledge about requirements of blood donation which is similar to what reported in a parallel study in Saudi Arabia.<sup>8</sup> 90.9% of the students gave incorrect answers about the suitable age to blood donation, the results of a similar study in 3 Universities in Kerman City also showed that 88.3% of students don't know the range of age to blood donation (17-60 years).<sup>7</sup> But this study also showed that students know a lot about blood borne diseases specially AIDS. Despite the poor knowledge they have; most of the students demonstrated affirmative attitude towards blood donation.<sup>6,9</sup> Knowledge and attitude are the major shareholders of the blood donation performance of students as well as the population.<sup>3</sup>

Relative or friend needs donation was the most common motivation factor.<sup>1,6,10</sup> Other factors were self-satisfaction, curiosity, emergency situations and medical reasons. The most frequent barriers were not being

asked, medically unfit, lack of information about donating services, health related issues like fear of infection, weakness and fear of injection.<sup>1,3,5,11</sup> Not being asked was the most common reported reason similar to what was presented in study in Pakistan.<sup>8</sup> In comparative studies, the most common motivation factor to blood donation was altruism,<sup>2,11,12,13,14</sup> and free blood screening and credits.<sup>15</sup> And the most reported barrier was health related concerns,<sup>10</sup> and lack of information about blood donation.<sup>6</sup> These differences could be due to various cultural perceptions and beliefs.

49% of blood donations in Sudan are from voluntary donors.<sup>2</sup> So, blood donation expeditions and educational sessions regarding the benefits and safety of blood donation and demands to blood supply should be available for the students and the population.

## CONCLUSION

The findings of this study regarding level of knowledge of blood donation, motivations and deterrents towards blood donation will help to focus the scope of educational sessions on the health related concerns and other major barriers and knowledge defects to address them in order to increase the rate of blood donation among students.

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