

Blood Donation Practice and Associated Factors among College Students in Kolfe Keraniyo Sub City, Addis Ababa, Ethiopia

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ABSTRACT

Availability of blood for transfusion is limited in Ethiopia, as is voluntary blood donation. Evidence relating to practice on blood donation among Ethiopians is also scarce. Therefore, assessing the level of blood donation practice and its determinants among students has a paramount importance in designing an effective strategy for sustaining adequate and safe blood provision. Hence, this study aimed to assess blood donation practice and associated factors among college students in Kolfe Keraniyo Sub City, Addis Ababa, Ethiopia.

Methods and materials: Institution based cross-sectional study was conducted among 354 college students from August 23, 2019 to October 7, 2019. The study participants were selected by multi stage sampling technique. A pre tested self-administered structured questionnaire was used to collect data. Binary logistic regression analysis was used to identify factors associated with blood donation practice.

Result: Out of 349 sampled college students 34.4% of participants had donated blood so far. The result showed that study participants aged 21-23 and 24 and above years were 2.23 and 3.38 times more likely to donate blood compared to study participants aged 18-20 years (AOR=2.23 (95% CI: 1.15, 4.33)) and (AOR=3.38 (95% CI: 1.52, 7.50)) respectively. Health science student were 3.06 times more likely to donate blood than non-health science students (AOR=3.06 (95% CI: 1.65, 5.67)). College students who were knowledgeable about blood donation were 7.99 times more likely to donate blood compared to those who were not knowledgeable (AOR=7.99 (95% CI: 3.99, 16.02)). Study participants who said the Blood Bank working hour is convenient were 2.12 times more likely to donate blood compared to those who said the working hour is not convenient (AOR=2.12 (95% CI:1.07, 4.19)).

Conclusion: Blood donation practice of college students was found to be low. Age, knowledge of blood donation, department and blood bank working hour convenience were significantly associated with blood donation practice. Hence, providing repeated blood donation awareness campaigns in the colleges and ongoing educational and motivational activities to encourage voluntary blood donation by the students.

Keywords: Blood donation; Practice; Students; College; Addis Ababa; Ethiopia

INTRODUCTION

Donating blood is an act that can save the lives of people worldwide because blood is an essential element of human life and there are no substitutes for it. In spite of extensive efforts and a number of blood donation programs being organized worldwide, the availability of blood still remains challenging [1,2]. Transfusion of blood and blood products helps save millions of lives every year. It can help patients suffering from life-threatening conditions and

with a higher quality of life, and can support complex medical and surgical procedures. An adequate supply of safe blood can only be assured through regular donations. Whose proposes all countries to obtain all their blood supplies from voluntary non-remunerated blood donors by 2020 [1].

Blood donation is the only source of blood but the recruitment of voluntary, non-remunerated donors poses major challenge

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throughout the world [3]. Blood is the essence of life, and is one of the most precious donations. Blood services are facing shortage of blood all over the world. Demand for blood is rising continuously and current blood donation is insufficient to meet the demand [4]. The only source of blood is by blood donation. World Health Organization (WHO) estimates that blood donation by 1% of the population is generally the minimum needed to meet a country's most basic requirements for blood [5].

Blood can save millions of life, and young people are the hope and Future of a safe blood supply in the world. Safe blood is a critical component in improving the health care and in preventing the spread of infectious diseases globally. There are 107 million blood donations per year globally, most of these by voluntary, unpaid donors. But of these voluntary donors, 30 million give blood once, and then do not return. In Sub-Saharan Africa (SSA) out of the estimated need of 18 million units of safe blood per year, merely about 15% were collected [6]. Globally, 80 million units of blood are donated each year, but only 2 million units are donated in sub-Saharan Africa where the need is very high [7]. In Sub-Saharan Africa (SSA) out of the estimated need of 18 million units of safe blood per year, merely about 15% were collected [8].

Taking in to account the big demand for safe blood and blood products across the nation and understanding the role of blood centers in the prevention of transfusion transmissible disease. The Federal Ministry of Health (FMOH) made a policy decision to revert the responsibility for the National Blood Transfusion Services (NBTS) from the Ethiopia Red Cross Society (ERCS) to a Government-led and managed service under the FMOH and the regional health bureaus a process which started in 2010 and was completed in 2013. The number of functional blood banks has increased from 12 to 25 and the number of Active mobile blood collection teams increased from 4 in 2012 to 31 in 2014 [9].

The Ministry of Health (MOH) of Ethiopia recognizes the insufficiency of adequate and safe blood supply across the nation, since the beginning of the fourth Ethiopian Health Sector Development Program (HSDP IV) [10]. The donation of blood from young students is ideal because the risk of acquiring the transfusion transmittable diseases from blood donated by the students is less than other groups [4].

Ethiopia Blood Bank planned to collect 241,107 unit of blood in 2018 and collected 186,497 units and in Addis Ababa planned to collect 84000 unit of blood of these 53879 units were collected. However, there is dearth of research conducted on blood donation among college students in Kolfe Keraniyo Sub City, Addis Ababa. Hence, this study aimed to assess blood donation practice and associated factors among college students in Kolfe Keraniyo Sub City, Addis Ababa, Ethiopia.

MATERIALS AND METHODS

Study design and setting

An institutional based cross-sectional study was conducted among college students in Kolfe Keraniyo Sub City in Addis Ababa from

August 23, 2019 to October 15, 2019. Addis Ababa is located between nine-degree latitude and 38-degree east longitude in plateau that stretches at the range of 2200-2800 meter above sea level. Addis Ababa is the capital city of Ethiopia. It is also the largest city in the country by population, with a total population of 3,384,569. Kolfe Keraniyo is one of the ten sub city of Addis Ababa, the capital of Ethiopia. The sub city is located in the western suburb of the city near the Gefersa reservoir. It borders with the sub city of Gullele, Addis Ketema, Lideta and Nifas Silk Lafto. Its population size was 546,219 from which 235,360 are females and 220,859 are males 546,219 [11]. The number of college in the sub city has 9 of which 4 health and 5 non-health. The total number of students in the sub city is around 16358 from which 7962 were Health College and 8396 were non health colleges.

Study population

The study population were all college students in Kolfe Keraniyo Sub City, Addis Ababa.

Sample size determination and sampling procedure

The sample size was determined using single population proportion formula by considering the 95% confidence level (CI), 5% marginal error and proportion of blood donation, 18.4% and using double population proportion formula using Epi-Info statistical calculation and considering one to one ratio and 80% power, design effect of 1.5 and 10% non-response rate based on a study conducted among undergraduate Madawalabu University students [12] and the largest sample size was taken which was 354.

Multi stage sampling technique was executed. The primary procedure was to select the college in Kolfe Keraniyo Sub City. The college was stratified in to health and non-health. From the total nine colleges (four health and five non-health colleges), four colleges (two health and two non-health) were selected by using simple random sampling technique. The total sample size of the study was allocated proportionally for the colleges. Finally, by using simple random sampling technique the study participants were selected.

Operational definition

Blood donation practice: Blood donation practice in this study was considered if the study participant had donated blood in the last five years.

Knowledge about blood donation: Knowledgeable: Participants who scored >4 of 7 knowledge based questions, Poor knowledge: Participants who scored ≤4 of 7 knowledge based questions

Attitude about blood donation: Favorable attitude: Participants who scored >4 of 7 attitude based questions, Unfavorable attitude: Participants who scored ≤4 of 7 attitudes based questions

Data collection procedure and quality assurance: The data were collected using self-administered structured questionnaire after taking consent from study participants. The questionnaire was

prepared in English language and translate to Amharic and then back to English to check for its consistency. Pretest was done on 5% of the samples at colleges which was not included in the study with some time gap to decrease information contamination before the actual data collections. The data collectors and supervisors were trained on data collection tools procedures for one day. On top of this, supervisors were follow data collectors and the investigators were also check for the collected data clear and completeness.

Data management and analysis

The collected data were coded, entered in to Epi-Info Version 7.0 and the cleaned data set was exported to statistical package for social science (SPSS) version 20.00 for analysis. Participants' socio-demographic characteristics and other variables were described using relevant descriptive statistics. Univariate binary logistic regression analysis was done at 25% level of significance to screen out potentially significant independent variables and using significant independent variables multivariable binary logistic regressions analysis was performed at 5% level of significance to see the association between the dependent variable and independent variables. To check the adequacy of the final model Hosmer and Lemeshow goodness of fit test was used and the model fitted for the data (p=0.128). The assumption of multi-collinearity was checked and no multi-collinearity detected. For binary logistic regression 95% confidence interval was computed and a variable with p-value <0.05 was considered as statistically significant to the dependent variable.

RESULTS

Socio-demographic characteristics of the study participants

From the estimated sample size of 354, 349 study participants were participated and making the response rate to be 98.5%. Most of the study participants, 168 (48.1%) were in the age group of 21-23 years. The majority of the study participant, 196 (56.2%) and 322 (92.3%) were female and currently single respectively. One hundred forty-six (41.8%) of the respondents were Orthodox Christian by religion. More than half of the participants, 194 (55.6%) were non health science students and regarding their year of study 145 (41.5%) were 2nd year students (Table 1).

Table 1: Socio-demographic characteristics of college students in Kolfe Keraniyo Sub City, Addis Ababa, Ethiopia, 2019 (n=349).

Variable	Categories	Frequency (n)	Percent (%)
Age	18-20 years	102	29.2
	21-23 years	168	48.1
	>=24	79	22.6
Sex	Male	153	43.8
	Female	196	56.2
Religion	Orthodox	146	41.8
	Muslim	94	26.9
	Protestant	109	31.2

Marital status	Single	322	92.3
	Married	27	7.7
Department	Health science	155	44.4
	Non health	194	55.6
Academic year	1st	59	16.9
	2nd	145	41.5
	3rd	129	37
	4th	16	4.6

Knowledge and attitude about blood donation

Most of the study participant, 215 (61.6%) were knowledgeable about blood donation and 216 (61.9) have positive attitude toward blood donation (Table 2).

Table 2: Knowledge and attitude about blood donation among college students in Kolfe Keraniyo Sub City, Addis Ababa, Ethiopia, 2019 (n=349).

Variable	Alternative	Frequency (n)	Percent (%)
Knowledge	Knowledgeable	215	61.6
	Not knowledgeable	134	38.4
Attitude	Good attitude	216	61.9
	Poor attitude	133	38.1

Source of information

Respondents who got information about voluntary blood donation from others (family, friends or and other blood donor), mass media and social media were 333 (95.4%), 328 (94%), 269 (77.1%) respectively (Table 3).

Table 3: Source of information among college students in Kolfe Keranyo Sub City, Addis Ababa, Ethiopia, 2019 (n=349).

Source of information	Alternatives	Frequency (n)	Percent (%)
Have you heard about blood donation from others (family, friends or and other blood donors)	Yes	333	95.4
	No	16	4.6
Have you heard about blood donation through mass media	Yes	328	94
	No	21	6
Have you heard about blood donation through social media	Yes	269	77.1
	No	80	22.9

Institutional factors

Most of the study participant, 324 (92%) stated that there was blood donation service within the institution. More than halve of the study participants, 231(66.2%) expressed that blood bank working hour was convenience for donation. Almost half of the study participant, 174 (49.9%) said that there was information access about blood donation and 154 (44.1%) study participants stated that Blood Bank provides educational promotion in the college (Table 4).

Table 4: Institutional factors among college students in Kolfe Keraniyo Sub City, Addis Ababa, Ethiopia, 2019 (n=349).

Variable	Alternatives	Frequency (n)	Percent (%)
Is there blood donation service in your college	Yes	324	92.8
	No	25	7.2
Is blood bank working hour Convenience for donation	Yes	231	66.2
	No	118	33.8
Does Blood Bank provide educational promotion in your college	Yes	154	44.1
	No	195	55.9
Is there easy way of getting information when you require	Yes	174	49.9
	No	175	50.1

Blood donation practice

Out of 349 study participants, 120 (34.4%, 95% CI: 29.4, 39.5) had donated blood so far and the remaining 229 (65.6%, 95% CI: 60.5, 70.6) did not donated blood. Of those 45% and 32.5% was donated blood one and two time in their life time respectively. From those study participants who donated blood all of them donated blood voluntarily. The reason for not donating blood were 124 (54.1%) fear of needle, 7 (3.1%) fear of knowing their HIV status and 68 (29.7%) no one has asked to donate blood. Most of the study participants 337 (96.6%) had willingness to donate blood in the future (Table 5).

Factors associated with blood donation practice

At 25% level of significance univariate binary logistic regression analysis age, religion, department, academic year, knowledge about blood donation, attitude toward blood donation, social media and mass media, availability of blood donation service, Blood Bank working convenience, accessibility of information and provision of educational promotion were significantly

associated with blood donation practice. However, at 5% level of significance multivariable binary logistic regression analysis only age, department, knowledge about blood donation and blood bank working hour convenience were found to be significantly associated with blood donation practice.

Accordingly, study participants aged 21-23, and 24 and above years were 2.23 and 3.38 times more likely to donate blood compared to study participants aged 18-20 years (AOR=2.23 (95% CI: 1.15, 4.33)) and (AOR=3.38 (95% CI: 1.52, 7.50)) respectively. Health science students were 3.06 times more likely to donate blood compared to non-health science students (AOR=3.06 (95% CI: 1.65, 5.67)). Students who were knowledgeable about blood donation were 7.99 times more likely to donate blood compared to those who were not knowledgeable (AOR=7.99 (95% CI: 3.99, 16.02)). Study participants who said the Blood Bank working hour is convenient were 2.12 times more likely to donate blood compared to those who said the working hour is not convenient (AOR=2.12 (95% CI:1.07, 4.19)) (Table 6).

Table 5: Blood donation practice among college students in Kolfe Keraniyo Sub City, Addis Ababa, Ethiopia, 2019(n=349).

Variables	Alternatives	Frequency (n)	Percent (%)	
Have you ever donated blood so far	Yes	120	34.4	
	No	229	65.6	
Have you donated blood in last five years	Yes	119	34.1	
	No	230	65.9	
If you donated, how many times (n=120)	1st	54	45	
	2nd	39	32.5	
	3rd	18	15	
	4th&above	9	7.5	
Why did you donated blood	Voluntary	120	100	
	Fear of needle	124	54.1	
	Fear of knowing their screen status	7	3.1	
	No remuneration	5	2.2	
	No one has asked to donate blood	68	29.7	
what are the reasons for not donating	Religion prohibits blood donation	1	0.4	
	Others	24	10.5	
Are you willing to donate blood in the future	Yes	337	96.6	
	No	12	3.4	

Table 6: Univariate and multivariable analysis for factors associated with practice of blood donation among college students in Kolfe Keraniyo Sub-City, Addis Ababa, 2019 (n=349).

Variable	Blood donation practice		COR (95%CI)		p-value	Yes
	Yes	No				
Age in years	18-20	25	77	1	1	
	21-23	60	108	1.71(0.99, 2.97)	2.23(1.15, 4.33)	0.018
	>=24	35	44	2.45(2.45, 1.30)	3.38(1.52, 7.50)	0.003
Religion	Orthodox	57	89	1.10(0.66, 1.84)	1.62(0.83,3.18)	0.16
	Muslim	23	71	1.10(0.66, 1.84)	0.67(0.32,1.41)	0.295
	Protestant	40	69	1	1	0.295
Department	Health science	66	89	1.92(1.23, 3.00)	3.06(1.65, 5.67)	<0.001
	Non health	54	140	1	1	
Academic year	2nd	46	76	0.67(0.41, 1.09)	0.94(0.49, 1.83)	0.862
	3rd	53	99	1	1	
	Others (1st and 4th)	21	54	0.56(0.30, 1.03)	0.73(0.31, 1.73)	0.474
Knowledge	Knowledgeable	106	109	8.34(4.50, 15.4)	7.99(3.99, 16.02)	<0.001
	Not Knowledgeable	14	120	1	1	
Attitude	Good attitude	95	121	3.39(2.03, 5.65)	1.86(0.99, 3.47)	0.051
	Poor attitude	25	108	1	1	
Info mass media	Yes	118	210	5.33(1.22, 23.32)	3.87(0.70, 21.26)	0.119
	No	2	19	1	1	
Info social media	Yes	100	169	1.77(1.01, 3.12)	0.69(0.33, 1.43)	0.321
	No	20	60	1	1	
Blood donation service	Yes	116	208	2.93(0.98, 8.73)	2.14(0.59, 7.80)	0.245
	No	4	21	1	1	
Working hour Convenience	Yes	95	136	2.60(1.55, 4.34)	2.12(1.07, 4.19)	0.031
	No	25	93	1	1	
educational promotion	Yes	64	90	1.76(1.13, 2.76)	2.11(0.95, 4.69)	0.067
	No	56	139	1	1	
Accessibility of info	Yes	69	105	1.59(1.02, 2.49)	0.43(0.18, 1.01)	0.054
	No	51	124	1	1	

DISCUSSION

Globally, there is a shortage of blood supply due to high blood demand and increase in medical treatment procedures requiring blood transfusion therapy particularly in developing countries. Ethiopia's current blood supply is far less compared to the demand, insuring adequate blood supply is vital for health care system. These is only be achieved by securing sustainable blood donors within the community [13].

In this study, it was found that 120 (34.4%) of students have ever donated blood in their life time which is almost equivalent to a study conducted among health science students in the Kingdom of Saudi Arabia (34.16%) and lower than South India (38%) [4,6]. On the other hand, it was higher than compared with the study done in Samara University health science student where donation status was 24.5% and Addis Ababa University health science students (23.4%) [12,14]. This might be due to current

promotional effect in National Blood Bank blood donation awareness campaigns and due to time variation in which studies done since college students were updated.

Study participants aged 21-23, and 24 and above years were 2.23 and 3.38 times more likely to donate blood compared to study participants aged 18-20 years respectively. Similar finding were also reported in Madawalabu University and University of Gondar Hospital [15,16]. The possible reason might be the fact that, as individuals get mature, they feel more socially responsible.

Health science students were 3.06 times more likely to donate blood compared to non-health science students. This might be the fact that health science students have more awareness and more exposure about health related issue than non-health science students.

Students who were knowledgeable about blood donation were 7.99 times more likely to donate blood compared to those who were not knowledgeable. This is supported by a study from Madawalabu University and Ambo University students which reported that the practice of blood donation was higher among respondents who were knowledgeable [15,16]. This justifies that having more knowledge about importance of blood donation makes college students to donate blood.

Study participants who said the Blood Bank working hour is convenient were 2.12 times more likely to donate blood compared to those who said the working hour is not convenient. The possible explanation for this finding might be those college students who have convenience time with the schedule of the Blood Bank may easily donate blood.

CONCLUSION

Blood donation practice among college students in this study was found to be low. Age, knowledge, department and Blood Bank working hour convenience were significantly associated with blood donation practice. Hence, providing repeated blood donation awareness campaigns in the colleges and ongoing educational and motivational activities to encourage voluntary blood donation by the students.

DECLARATIONS

Ethics approval and consent to participate

Ethical clearance was obtained from GAMBY Medical and Business College. After securing clearance from GAMBY Medical and Business College, support letter was obtained to concerned bodies. The purpose and importance of the study was explained and written informed consent was obtained from the study participants. Participation in the study was on voluntary basis; participants who were unwilling to participate in the study and those who wish to stop participation in the meantime had the right to withdraw. Confidentiality of the response was declared to the respondents by the anonymity of the self-administered questionnaires. Finally, confidentiality at all level was maintained. Detail explanation about the objective and purpose was described to the study participants to ensure their full cooperation.

Consent to publish

The consent for publication was obtained from each study participants during data collection.

Availability of data and materials

The data set supporting the conclusions of this article are available in the manuscript.

Competing interests

The authors declared that they have no competing interests.

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Authors' contributions

All authors meet the ICMJE criteria for co-authorship, providing substantial intellectual contributions for the manuscript. Both authors contributed to data analysis, drafting and revising the article, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

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