

Factors Affecting Voluntary Blood Donation among Admas University Students, Addis Ababa, Ethiopia: A Case Control Study

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ABSTRACT

Introduction: Blood donation is an act of a healthy person giving blood which will be used by another person in transfusion therapy and since it is a non-pharmaceutical product it has to come directly from a human being through donation. Accessibility of a safe and adequate blood transfusion is a challenge worldwide and even more critical in sub-Saharan Africa. There is limited information regarding blood donation practice and associated factors in Ethiopia including the study area. Hence, this study aimed to determine factors affecting voluntary blood donation among Adams University Students in Addis Ababa, Ethiopia.

Methods: Institutional based unmatched case control study was conducted from July 23, 2019 to September 15, 2019 among 402 Adams University students in Addis Ababa. Simple random sampling technique was used to select the study participants. A self-administered structured questionnaire was used for data collection. Binary logistic regression analysis was used to see the factors affecting voluntary blood donations. Odds ratio with 95% CI and p-value were calculated to ascertain the association between dependent and independent variables and variables with p-value <0.05 will be considered as statistically significant.

Results: Level of education (AOR=3.73, 95% CI: 1.21, 11.45), department (AOR=2.90, 95% CI: 1.82, 24.23), attitude towards voluntary blood donation (AOR=2.01, 95% CI: 1.02, 3.97), mass media (AOR=9.80, 95% CI: 1.79, 53.80), social media (AOR=1.70, 95% CI: 1.06, 2.79) and trust on blood transfusion services (AOR=0.03, 95% CI: 0.01, 0.29) were significantly associated with voluntary blood donation among Admas University students.

Conclusion: Level of education, department, mass media, social media, attitude towards voluntary blood donation, and trust on blood transfusion services were significantly associated with voluntary blood donation among Admas University students. Therefore, an intervention activity to bring attitude changes and to increase knowledge level of students on voluntary blood donation is crucial. Clubs in the university should organize different events to build students attitude positively and to increase the numbers of blood donors.

Keywords: Factors affecting; Voluntary; Blood donation; Addis Ababa; Ethiopia

INTRODUCTION

Blood is a specialized body fluid in humans that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells. Human blood is an element of human life [1]. The ancient Egyptians recognized the important properties of blood and it

was used to resuscitate the sick, rejuvenate the old and infirm by bathing them with it and they also used it as a tonic for the treatment of various disorders [2]. Blood donation is an act of a healthy person giving blood which will be used by another person in transfusion therapy and since it is a non-pharmaceutical product it has to come directly from a human being through donation [3]. A blood donation occurs when a

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person voluntarily has blood drawn and used for transfusions and/or made into biopharmaceutical medications by a process called fractionation (separation of whole-blood components). Donation may be whole-blood or specific components directly (the latter called apheresis). Blood banks often participate in the collection process as well as the procedures that follow it. The age range to donate blood is between 18 years up to 65 years with 45 and above kg of weight. The amount of blood donated in a single donation is from 350 ml to 450 ml. The other eligibilities to donate are hemoglobin more than 12.5 gm/dl for females and 13.5 gm/dl for males, similarly a blood pressure of 100-150/70-90 mmHg. Time taken in the donation is only for bleeding it takes five to seven minutes [4,5].

It is estimated that 44% of maternal deaths due to blood loss during childbirth, 20% of maternal and 15% of child death as a result of anemia in Africa region could be managed with a well-timed safe blood transfusion [6]. According to the latest WHO survey on blood safety and availability, 40 African countries including Ethiopia collect less than 10 blood donations per 1000 population per year; of these, 25 countries collect less than half the blood that they need to meet transfusion requirements. High-income countries collect around 35 donations per 1000 population per year. In many countries, family members are often pressured to donate blood or find a replacement donor in an emergency situation. This causes emotional and financial stress, and significant delays in obtaining suitable blood, and also puts women at risk of blood-borne infections as there is often no time or facilities to properly screen the donated blood [3,7]. Whole blood donations per 1,000 population as an indicator for the general availability of blood in a country, low-income countries including Ethiopia has a rate of 2.8 donations/1000 population (range 0.4-8.2) which is very low as compared to 36.4 donations/1000 population (range 13.3-64.6) in developed countries [8]. Even if a donated blood plays a big role during surgery, accident, delivery cases, bleeding cases such as peptic ulcer, liver diseases, lung diseases, cancer cases, blood diseases such as hemophilia, anemia, and thalassemia, the newborn baby with blood diseases, burn cases, etc. but it is a big problem to transfusion due to insufficient blood collection [9]. WHO estimates that blood donation by 1% of the population is generally the minimum needed to meet the population basic requirements for blood; the requirements are higher in countries with more advanced health care systems [10]. Globally, based on samples of 1000 people, the blood donation rate is 32.6 donations in high-income countries, 15.1 donations in upper-middle-income countries, 8.1 donations in lower-middle-income countries and 4.4 donations in low-income countries [11]. Safe blood is a vital component in improving healthcare globally and millions of lives are saved each year through blood donation. But most hospitals in the developing countries face challenges of a constant supply of blood to carry out different life-saving procedures that require blood, due to paucity of blood donors [5,12].

In the developed world, most blood donors are voluntary non-remunerated repeat donors who donate blood for a community supply. In poorer countries established supplies are limited and donors usually give blood when family or friends need a transfusion [13]. Many donors donate as an act of charity, but in

countries that allow paid donation some donors are paid, and in some cases, there are incentives other than money such as paid time off from work. Donors can also have blood drawn for their own future use (autonomous donation). Donating is relatively safe, but some donors have to bruise where the needle is inserted or may feel faint [3]. These countries with well-structured health systems have effective blood donor programs, more voluntary donors, higher donation rates and more available blood. In contrast, in developing and transitional countries, chronic blood shortages are common. Well organized health care providers may be available in major urban, but a large amount of the population in rural areas have access only to more limited health services in which blood transfusion may be unsafe or not available at all [11]. Blood donation rates in Africa are generally low, according to the WHO report on 2019 sixty-six countries report collecting fewer than 10 donations per 1000 people. Of these, 37 countries are in the WHO African Region, 7 in the WHO Region of the Americas, 5 in the WHO Eastern Mediterranean region, 4 in the WHO European Region, 7 in the WHO South-Eastern Asia Region, and 6 in the WHO Western Pacific Region. All are low- or middle-income countries [14].

Though WHO estimates that blood donation by 2%-3% of the country's population is needed to meet a nation's most basic requirements for blood, less than 0.5% of Ethiopian's population donates blood [3]. As there are limited blood donors and the shelf life of the collected blood is very short the service can only meet 52% of hospital demand which lets many patients in need of blood to die or suffer [15]. Blood transfusion saves lives and improves health, but many patients requiring transfusion do not have timely access to safe blood. Providing safe and adequate blood should be an integral part of every country's national health care policy and infrastructure [16]. Maternal mortality and death from severe acute anemia and accidental trauma are major consequences of shortage in blood supply. 25% to 40% of Ethiopian mothers die due to lack of enough blood from donors each year [17]. Fear of needles, pain, the sight of blood, future weakness, and possible ill effects, an objection from elders, ignorance, and illiteracy, etc. are all reasons for many people who are hesitant in donating blood. All these myths and misconceptions are to be removed in order that an adequate amount of blood is made available at blood banks for saving the patients [3].

The Ethiopian National Blood Bank planned to collect 241,107 units of blood in 2018 and collected 186,497 units, from these 21,205 units of blood were distributed and 11.37% was discarded [18]. Despite the fact that the gap between the intended and achieved could be of different reasons the main one is not having enough pool of regular blood donors. As this donors defined to be the best source of blood in number adequacy and low rate of discarded blood [11]. There is limited information regarding blood donation practice and associated factors in Ethiopia including the study area. Hence, this study aimed to determine factors affecting voluntary blood donation among Adams University Students in Addis Ababa, Ethiopia.

METHODS

Study design and setting

Institution based unmatched case control study was conducted in Admass University from July 23, 2019 to September 15, 2019 in Addis Ababa the capital city of Ethiopia. The University has six campuses which is Olompiya and Megenagna campuses found in Bole sub city, Mekanisa campus found in Nifas Silk Lafto sub city, Meskel flower campus found in Kirchos sub city, East campus found in Yeka sub city and Kality campus found in Akaki- Kality sub city. Among these campuses, Olompiya is the largest one which is around five thousand students and Kality campus is the smallest one which is around three thousand students. In general, around twenty-four thousand six hundred students were available in all six campuses of the University.

Study population

The study populations were students both voluntary blood donors (case) and non-blood donors (controls) in Admass University, Addis Ababa.

Sampling size determination and sampling procedure

The sample size was determined based on double population proportion formula using epi-info statistical calculation and considering one-to-two cases-to-controls ratio; 95% confidence interval, 80% study power and 10% non-response rate based on a study conducted in Madawalabu University [19]. The final sample size was 402. Admas University had six campuses with 24, 600 students. Among these students 870 of them donated blood in the previous year. Simple random sampling technique was used to select the study participants. The selection was with proportional allocation from the six campuses. Finally, 134 cases and 268 controls were recruited.

Operational definitions

Voluntary blood donation: A person who donates blood at least once by his/her free, no payment for it, either in the form of cash or in kind which could be considered a substitute for money [12].

Case: Students who donated blood at least once in their life time.

Controls: Students who never donated blood.

Knowledge on blood donation: Knowledge is respondent's ability to respond to questions related to blood donation. Participants who were answer =8 of 10 knowledge based questions were classified as having inadequate knowledge and Participants who were answer >8 of 10 knowledge based questions were considered as having adequate knowledge on blood donation [20].

Attitude on blood donation: Those Participants who were answer >4 of 6 on attitude based questions for attitude questions were labeled as having positive attitude and participants who were answer ≤4 of 6 on attitude based questions were labeled as having negative attitude [20].

Data collection procedures and quality

A structured self-administered questionnaire was used to collect data from study participants. The questionnaire was designed in English and translated to local language, Amharic and then back to English by the third person to check consistency. The data quality was maintained by using several methods. First, the questionnaire internal consistency was checked by previous researchers. Second, the adopted questionnaire was pre-tested at Ethiopian National Blood Bank Service by voluntary blood donors. The questionnaire was pretested in other university for validation of questionnaire on 5% of the sample size. Trained data collectors and supervisors were recruited to collect the data. Before the actual data collection one-day training was given for the data collectors and supervisors to ensure quality of the data.

Data management and analysis

The collected data were entered using Epi-Info version 7.0 statistical software and then exported to SPSS version 22.0 for analysis. Descriptive statistics of the collected data were done using relevant statistical parameters such as frequency and percent. At 25% level of significance univariate binary logistic regression analysis was done to screen out potentially significant independent variables and using significant independent variables multivariable binary logistic regressions analysis was performed to see the association between the dependent variable and independent variables. To check the adequacy of the final model Hosmer-Lemeshow goodness of fit test was used and the model fitted for the data. The assumption of multi-collinearity was checked and no multi-collinearity was detected. For multivariable binary logistic regression, 95% confidence interval was computed and variables with p-value <0.05 were considered as statistically significant to the dependent variable.

RESULTS

Socio demographic characteristics

A total of 129 cases and 263 controls were participated in this study with the response rate of 97.5%. From the total participants 96 (24.5%) of cases and 202 (51.5%) controls were female students; 106 (27.0%) of cases and 174 (44.4%) controls were in the age group of 18-25 years; 56 (14.3%) of cases and 132 (33.7%) of control were Orthodox religion followers; 73 (18.6%) of cases and 131 (33.4%) of controls were first year students; 52 (13.3%) of cases and 108 (27.6%) of controls were from accounting department (Table 1).

Socio demographic variable	Case (n=129) (%)	Control (n=263) (%)	Total (392)	
Gender	Female	96 (24.5%)	202 (51.5%)	298 (76.0%)
	Male	33 (8.4%)	61 (15.6%)	94 (24.0%)
Age group	18-25	106 (27.0%)	174 (44.4%)	280 (71.4%)
	>25	23 (5.9%)	89 (22.7%)	112 (28.6%)

Religion	Muslim	48 (12.2%)	81 (20.7%)	129 (32.9%)
	Orthodox	56 (14.3%)	132 (33.7%)	188 (48.0%)
	Protestant	6 (1.5%)	35 (8.9%)	41 (10.5%)
	Others	19 (4.8%)	15 (3.8%)	34 (8.7%)
Level of education	1st years	73 (18.6%)	131 (33.4%)	204 (52.0%)
	2nd year	31 (7.9%)	101 (27.8%)	132 (33.7%)
	3rd years	25 (6.4%)	31 (7.9%)	56 (14.3%)
Departments	Computer science	35 (8.9%)	58 (14.8%)	93(23.7%)
	Economics	12 (3.1%)	43 (11.0%)	55 (14.0%)
	Managemen ts	18 (4.6%)	39 (9.9%)	57 (14.5%)
	Accounting	52 (13.3%)	108 (27.6%)	160 (40.8%)
	Others	12 (3.1%)	15 (3.8%)	27 (6.9%)

Table 1: Distribution of socio demographic characteristics of students in Admas University in Addis Ababa, Ethiopia, 2019 (n=392).

Institutional factors

Among 129 cases 263 controls; 104 (26.6%) of cases and 195 (49.7%) of controls knew the National Blood Bank working hour. 9 (24.5%) of cases and 184 (46.9%) of controls have learnt about voluntary blood donation by the National Blood Bank; 83 (21.1%) of cases and 179 (45.7%) of controls had information about the blood donation scheduled date (Table 2).

Institutional factors		Case (n=129) (%)	Control (n=263) (%)	Total (392)
Do know the National bank working hour in a day	Yes	104 (26.6%)	195 (49.7%)	299(76.3%)
	No	25 (6.4%)	68 (17.3%)	93 (23.7%)
Do you have learnt about voluntary blood donation by the national blood bank	yes	96 (24.5%)	184 (46.9%)	280 (71.4%)
	No	33 (8.4%)	79 (20.2%)	112 (28.6%)
Do you have the information of the blood donation	Yes	83 (21.1%)	179 (45.7%)	262 (66.8%)
	No	46 (11.7%)	84 (21.4%)	130 (33.2%)

scheduled date

Table 2: Institutional factors among Admas university students in Addis Ababa, Ethiopia, 2019 (n=392).

Source of information

Among the total study participates, 120 (30.6%) of cases and 159 (40.6%) of controls got information from family and friends; 72 (18.4%) of cases and 171 (43.6%) of controls got information from mass media; 93 (23.7%) of cases and 225 (57.4%) of controls got information from social media (Table 3).

Source of information		Case (n=129) (%)	Control (n=263) (%)	Total (392)
Friend and family	Yes	120 (30.6%)	159 (40.6%)	279 (71.2%)
	No	9 (2.3%)	104 (26.5%)	113 (28.8%)
Mass media	Yes	72 (18.4%)	171 (43.6%)	243 (62.0%)
	No	57 (14.5%)	92 (23.5%)	149 (38.0%)
social media	Yes	93 (23.7%)	225 (57.4%)	318 (81.1%)
	No	36 (9.2%)	38 (9.7%)	74 (18.9%)

Table 3: Distribution of source of information among Admas university students in Addis Ababa, Ethiopia, 2019 (n=392).

Trust in blood transfusion service

Among 129 cases 263 controls, 108 (27.6%) of cases and 228 (58.1%) of controls believed NBBS used donated blood properly; 47 (12.0%) of cases and 122 (31.1%) of controls were 100% trust NBBs provided the blood for free; 5 (1.3%) of cases and 51 (13.0%) of controls believed the blood distributed for free only to governmental health institutions and to the private for sale. whereas, 45 (11.5%) of cases and 67 (17.1%) of controls did not believed it is for free (Table 4).

Trust in blood transfusion Service		Case (n=129) (%)	Control (n=263) (%)	Total (392)
Do you think NBBS uses your donated blood properly	Yes	108 (27.6%)	228 (58.1%)	336 (85.7%)
	No	21 (5.4%)	35 (8.9%)	56 (14.3%)
How much do you trust them	-	45 (11.5%)	67 (17.1%)	112 (28.6%)

will providing the collected blood to health care in free I do not believe them they will proving to in free	-	47 (12.0%)	122 (31.1%)	169 (43.1%)
100% I trust the NBBS providing in free	-	5 (1.3%)	51 (13.0%)	56 (14.3%)
They may provide to government health Institution for free and to the private for sale	-	32 (8.2%)	23 (5.8%)	55 (14.0%)
All will be for sell	-			

Table 4: Trust in blood transfusion service among Admas University students in Addis Ababa, Ethiopia, 2019 (n=392).

Knowledge and attitude

Among the total study participates, 108 (27.5%) of cases and 217 (55.4%) of controls were knowledgeable; and 85 (21.7%) of cases and 166 (42.3%) of controls had positive attitude (Table 5).

Variables		Case (n=129) (%)	Control (n=263) (%)	Total (392)
Knowledge	Knowledgeable	108 (27.56%)	217 (55.4%)	325 (82.9%)
	Not Knowledgeable	21 (5.4%)	46 (11.7%)	67 (17.1%)
Attitude	Positive	85(21.7%)	166(42.3%)	251(64.0%)
	Negative	44 (11.2%)	97(24.7%)	141(36.0%)

Table 5: Distribution of knowledge and attitude among Admas university students in Addis Ababa, Ethiopia, 2019 (n=392).

Voluntary blood donation

Among 129 cases, 56 (14.3%) of them donated blood once. Among the controls, 111 (28.3%) and 75 (19.1%) of the study participants did not donated blood due to fear of needle and time constraint respectively (Table 6).

Voluntary Blood Donations			Case (n=129) (%)	Control (n=263) (%)
How many times you donated	Once		56 (14.3%)	-
	Twice		28 (7.1%)	-
	Three times		17 (4.3%)	-
	Four times		13 (4.3%)	-
	Five times and above		15 (3.8%)	-
Reason not to donate blood				
	Fear of needle		-	111(28.3%)
	No enough time		-	75 (19.1%)
	Transportation problem		-	22 (5.6%)
	No one invite me to donate blood		-	55 (14.0%)

Table 6: Distribution of voluntary blood donation among Admas university students in Addis Ababa, Ethiopia, 2019 (n=392).

Factors associated with voluntary blood donation

At 25% level of significance univariate binary logistic regression analysis age, religion, level of education, department, knowledge of voluntary blood donation, attitude towards voluntary blood donation, National Blood Bank working hour, mass media, social media and trust in blood transfusion services were significantly associated with voluntary blood donation. However, only level of education, department, attitude towards voluntary blood donation, source of information and trust in blood transfusion services were found to be significantly associated with voluntary blood donation in the multivariable binary logistic regression model at 5% level of significance.

Accordingly, the odds of voluntary blood donation among first year students were 3.73 times the odds of second year students (AOR=3.73, 95% CI: 1.21, 11.45). Regarding department, the odds of voluntary blood donation among economics students were 2.90 times the odds of computer sciences students (AOR=2.90, 95% CI: 1.82, 24.23). The odds of voluntary blood donation among Students who had positive attitude were 2.01 times the odds of those who had negative attitude towards voluntary blood donation (AOR=2.01, 95% CI: 1.02, 3.97).

The odds of voluntary blood donation among Students who heard about voluntary blood donation by mass media were 9.80 times the odds of those who did not heard by mass media (AOR=9.80, 95% CI: 1.79, 53.80) and the odds of voluntary blood donation among students who heard about voluntary blood donation by social media were 1.70 times the odds of

those who did not heard by social media (AOR=1.70, 95% CI: 1.06, 2.79). Students who believed that the donated blood provide to government health institution for free and to the private for sale were 97% less likely to donate blood voluntarily than those students who did not believe it is not provided for free (AOR=0.03, 95% CI: 0.01,0.29) (Table 7).

Variable	Case (n=129) (%)	Control (n=263) (%)	COR (95%CI)	AOR(95%CI)	p-value
Age in years	18-25 (27.0%)	174 (44.4%)	2.36(1.4, 3.96)	1.27(0.5, 2.85)	0.559
	>25 (5.9%)	89 (22.7%)	1	1	
Religion	Muslim (12.2%)	81 (20.7%)	1	1	
	Orthodox (14.3%)	132 (33.7%)	0.72(0.4, 1.15)	0.42(0.0, 2, 8.05)	0.563
	Protestant (1.5%)	35 (8.9%)	0.29 (0.11,0.74)	0.64(0.0, 2, 3.36)	0.824
	Others (4.8%)	15 (3.8%)	2.14(0.9, 4.60)	0.18(0.0, 3, 1.24)	0.104
level of education	1st years (18.6%)	131 (33.4%)	1.82(1.1, 2.98)	3.73(1.2, 11.45)	0.022*
	2nd year (7.9%)	101 (27.8%)	1	1	
	3rd years (6.4%)	31 (7.9%)	2.63(1.3, 5, 5.10)	2.10 (0.59, 7.44)	0.25
Department	Computer (8.9%)	58 (14.8%)	1	1	
	Economics (3.1%)	43 (11.0%)	0.46(0.2, 0.99)	2.90(1.8, 2, 24.23)	0.015*
	Managements (4.6%)	39 (9.9%)	0.77(0.3, 1.54)	0.67(0.0, 9, 4.88)	0.691
	Accounting (13.3%)	108 (27.6%)	0.80(0.4, 1.36)	2.25(0.4, 7, 10.79)	0.311
	Others (3.1%)	15 (3.8%)	1.33(0.5, 3.16)	1.83(0.0, 4, 81.27)	0.756
Knowledge	Knowledgeable (27.5%)	217 (55.4%)	1.06(0.5, 3, 2.13)	1.18(0.5, 8, 2.38)	0.639
	Not knowledgeable	21 (5.4%)	46 (11.7%)	1	1

Attitude	Positive	85(21.7%)	166(42.3%)	1.13(0.7, 3,1.76)	2.01(1.0, 2, 3.97)	0.043*
	Negative	44 (11.2%)	97(24.7%)	1	1	
Knew National Blood Bank working hour	Yes	104 (26.6%)	195 (49.7%)	1.45(0.8, 7, 2.43)	2.73(0.5, 4, 13.77)	0.22
	No	25 (6.4%)	68 (17.3%)	1	1	
Source of information						
Friends and family	Yes	120 (30.6%)	159 (40.6%)	8.72(4.2, 4,17.94)	3.73(0.9, 1, 15.23)	0.067
	No	9 (2.3%)	104 (26.5%)	1	1	
Mass media	Yes	72 (18.4%)	171 (43.6%)	0.68(0.4, 4, 1.05)	9.80(1.7, 9, 53.80)	0.009*
	No	57 (14.5%)	92 (23.5%)	1	1	
Social media	Yes	93 (23.7%)	225 (57.4%)	0.44(0.2, 6, 0.73)	1.70 (1.06, 2.79)	0.002*
	No	36 (9.2%)	38 (9.7%)	1	1	
Trust in blood transfusion services						
Didn't trust providing for free	100% trust providing for free	45 (11.5%)	67 (17.1%)	1	1	
	To government health Institution for free and to the private one for sale	5 (1.3%)	51 (13.0%)	0.15(0.0, 5, 0.39)	0.03 (0.01,0.29)	0.003*
All will be for sell	100% trust providing for free	47 (12.0%)	122 (31.1%)	0.57(0.3, 5,0.95)	0.54(0.1, 9,01.52)	0.244
	All will be for sell	32 (8.2%)	23 (5.8%)	2.07(1.0, 8, 3.99)	3.82(0.9, 6,15.23)	0.058

Note: COR Crude odds ratio; AOR=adjusted OR and CI= Confidence Interval, *Statistically significant, p<0.05

Table 7: Univariate and multivariable binary logistic regression analysis for factors associated with voluntary blood donation among Admas University students in Addis Ababa, Ethiopia, 2019 (n= 392).

DISCUSSION

In line with the objective of the study, an effort was made to find out the factors affecting voluntary blood donation among Admass University Students in Addis Ababa. Accordingly, the odds of voluntary blood donation among first year students were 3.73 times the odds of second year students. First year students are more eager to establish or strengthen blood donation clubs since they are fresh and they are too sensitive to join any activities, focusing on blood donation campaigns through the mobilization and motivation of students to remove the misconceptions than the second-year students. A similar study done among Madawalabu University students showed year of study was significantly associated with voluntary blood donation which first year students more donated than other batches [19]. Department was also among the statistically significant factors. The odds of voluntary blood donation among economics students were 2.90 times the odds of computer sciences students. This might be due to the higher frequent age Economics students are in relative to computer sciences students.

The odds of voluntary blood donation among Students who had positive attitude were 2.01 times the odds of those who had negative attitude towards voluntary blood donation. This may be due to the fact that those who had negative attitude perceived that they are unfit, fear to give blood related to culture. A similar study done in Iraq, Madawalabu [19] and Arsi University, showed that attitude was significantly associated with voluntary blood donation. The odds of voluntary blood donation among Students who heard about voluntary blood donation by mass media were 9.80 times the odds of those who did not heard by mass media. This might be due to those who heard about voluntary blood donation through mass media could gain better information about blood donation. Well-constructed ideas, information's and human-interest stories that provided to responsive journalists used strengthen information dissemination through mass media. The odds of voluntary blood donation among students who heard about voluntary blood donation by social media were 1.70 times the odds of those who did not heard by social media. This might be due to those who have higher access and better information from social media about blood donation may have better understanding. Students who believed that the donated blood provide to government health institution for free and to the private for sale were 97% less likely to donate blood voluntarily than those students who did not believe it is not provided for free. The possible explanation for this finding might be when there is lack of information about blood transfusion service, the donors may have not trust on blood transfusion because of this reason they may not donate blood.

CONCLUSION

Level of education, department, mass media, social media, attitude towards voluntary blood donation and trust in blood transfusion services were significantly associated with voluntary blood donation among Admas University students. Therefore, intervention activities to bring attitude changes and to increase knowledge level of students on voluntary blood donation are crucial. Clubs in the university should organize different events

to build students attitude positively and to increase the numbers of blood donors.

DECLARATIONS

Ethics approval and consent to participate

Ethical clearance was obtained from GAMBY Medical and Business College and Addis Ababa Health Bureau Ethical Review Board. Written informed consent was obtained from study participants after being informed in detail about the objective and benefits of the study. Participation was voluntarily. Appropriate measures were taken to assure confidentiality of information both during and after data collection.

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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