Review Article   OMICS International

Knowledge, Attitude, Practice and Associated Factors of Voluntary Blood Donation among Undergraduate Students in Hargeisa University

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Abstract

Background: Availability of blood for transfusion is limited in Somaliland; as is the evidence relating to knowledge, attitude and practice on blood donation among youth Since youth represent both large share of the population and important group of potential donors, this study attempts to investigate what factors may be important to consider for promoting voluntary blood donation among them.

Objectives: To assess the Knowledge, Attitude, Practice (KAP) of Voluntary Blood Donation and associated factor among undergraduate students in Hargeisa University.

Methods: An institutional based cross-sectional study was conducted on 311 undergraduate regular students in the University of Hargeisa from March 1-12 2016. The study participants were selected using stratified random sampling. A pre-tested structured questionnaire was used to collect data. Variables with P-value<0.25 were selected as candidates for Multivariate regression and variables with P-value<0.05 were considered as statistically significantly associated.

Results: The proportion of students having adequate knowledge was 46.6% and significantly associated with being a medical student [AOR: 2.591, 95% CI: 1.518, 4.422]. The proportion of students having favorable attitude was 46.9% and significantly associated with being a student at the faculty of Applied Science [AOR: 2.8, 95% CI: 1.136, 6.956], Health Science [AOR: 3.8, 95% CI: 1.205, 12.554] and Social Science [AOR: 10.00, 95% CI: 1.786, 55.976]. The proportion of students who have ever donated blood was 11.3% and significantly associated with age [AOR: 1.284, 95% CI: 1.078, 1.530] and being a male [AOR: 7.465, 95% CI: 2.104, 26.487].

Conclusion and Recommendation: More than half of the students had inadequate knowledge and unfavorable attitude towards blood donation; and majority of them had never donated blood. University Administrators in collaboration with Ministry of Health and Hargeisa Group Hospital's Blood Bank Department must come up with plans to increase KAP of blood donation among university students.

Keywords: Knowledge; Attitude; Voluntary blood donation; Undergraduate students; University of Hargeisa

Abbreviations: AOR: Adjusted Odds Ratio; CI: Confidence Interval; COR: Crude Odds Ratio; HIV: Human Immunodeficiency Virus; KAP: Knowledge Attitude and Practice; OR: Odds Ratio; SPSS: Statistical Package for Social Science; UOH: University of Hargeisa; WHO: World Health Organization

Introduction

Blood is unique body fluid that performs vital functions for humans by carrying oxygen and nutrients to the cells and carrying out carbon-dioxide and metabolic wastes away from those same cells. Ancients Egyptians used to use blood for different purposes including when practicing healing rituals. In the early 20th century, Dr. Karl Landsteiner made a scientific break-through by discovering the ABO blood group system that was crucial in blood donation. The first blood bank storage unit was made in 1973 in Chicago. As the First World War ended, transfusion of blood was accepted as the treatment of choice for dealing with severe blood loss. Blood safety is important in enhancing health care and in preventing the spread of infectious disease. Each year blood transfusion helps save many lives, yet three issues remain a major constraint in the developing world: quality, quantity and safety of blood [1].

Blood transfusion is a vital component of health care. It helps saves millions of lives yearly through routine and emergency situations, aids in complex medical and surgical conditions and in improving the quality of life of the patients with different acute and chronic illnesses. In all health facilities, the accessibility of safe blood on time is very important; however, in many developing countries this constitutes a problem and the gap between blood demand and supply is widening. The capacity of health care system and its coverage of the population determine the national blood requirement of a country. In advanced health care system, such as those found in developed countries, the demand for blood continues to rise to sustain increasingly sophisticated medical procedures [2].

Voluntary unpaid blood donors whose blood has been checked for infection are the best source of safe blood. A resolution adopted by the

World Health Assembly in 2010 highlighted that "secure supply of safe blood components, based on voluntary, non-remunerated blood donation must be an important national goal of every country to prevent blood shortages". Blood supply in many middle and low income countries are in an alarming stage, especially in Sub-Saharan Africa which has the highest maternal mortality rate of 510 deaths per 100,000 live births [2].

A survey conducted by WHO in 2014 on blood safety and availability showed that out of 54 African countries, 40 countries (including Somalia/Somaliland) collected less than 10 blood donations per 1000 population per year; out of these, 25 countries collect less than half of the blood need to meet transfusion requirements. In contrast, high-income countries collect around 35 blood donations per 1000 populations per year [3]. In Somaliland, were severe blood shortage is evident, family members are often forced to donate blood or find a replacement donor during an emergency situation. This results in a financial and emotional strain and causes significant delay in getting appropriate blood. This condition may also put many lives in danger, especially women, in contracting blood borne infections since there is no time or adequate facilities to properly screen donated blood.

Over 100 million blood units are collected annually throughout the world and yet many more is needed to achieve global demand to guarantee adequate and timely availability of blood [4]. According to WHO estimates, for a country health care system to achieve minimum requirement of blood, 1% of its population has to donate. The requirement increases as the health care system advances. The average donation rate in developing countries is 15 times lower compared to developed countries. In a survey conducted by WHO in 2006 reported that more than 70 countries had blood donation rates less than the WHO established standard of 1% or 10 donations per 1000 population [5]. Of the 108 million blood donations collected globally, half of these are collected in high-income countries, home to 18% of the world's population. The rate of blood donation in high, middle and low income countries are 36.8, 11.7 and 3.9 donations per 1000 population respectively. Within 8 years (from 2004-2012) an increase of 8.6 million donations has been reported globally. In total, 73 countries collect over 90% of their blood from voluntary un-remunerated blood donors; though the figure from other sources of blood, such as family/replacement or paid are 50% in 72 countries [6]. Out of 193 countries, 54 countries reached 100% voluntary blood donation; of these 68% are developed countries while transitional and developing countries account for 23% and 9% respectively. The average donation rate is 31 per 1000 population in countries with 100% voluntary blood donation; were as this rate is 9 per 1000 population in countries with 50% or less voluntary blood donation. Donation rates in Africa are very low and it's estimated at about 4.15 per 1000 population in 2006, compared to over 30 per 1000 population on average in developed countries. WHO estimated that Africa requires 8 million units of blood in 2006, but only 3.2 million units were collected. Blood requirements in many countries in the region are very insufficient and not enough is being collected for the population [2]. In Hargeisa the case is not different. Blood requirements have been estimated at 10,000 units; but only 6,000-6,500 units are collected annually, that is 4-4.33 donations per 1000 population, which is very low.

University represents a great source of blood for collection agencies. There is large population of mostly young and healthy people who can be easily reached. Regrettably, at most tertiary level institutions, most students do not intend to donate [7]. Fear of needles, pain and sight of blood, fear of future weakness, possible ill effects, ignorance and illiteracy are some reasons for many people who are hesitant in donating blood. All of the above false convictions must be removed in order for sufficient amount of blood to be made available for blood banks in saving lives [8]. Blood donation rates must be improved, especially among the youth, in order to help reduce shortages [7].

Methods and Materials

Study setting

The population of Somaliland has been estimated at approximately 3.5 million residents; the population consists of nomads (33.8%), urban (52.9%), IDPs (2.4%) and rural dwellers (11%). The capital and the largest city is Hargeisa, has a population of a little over a million residents. The annual population growth rate is 2.7%. Life expectancy at birth is 51.8. The population density has been estimated at 25 persons per square km in 2014. The approximately 3.5 million populations are served by 25 hospitals, 91 health centers, and 164 health posts. The country has one blood bank managed by Hargeisa Group Hospital, the largest referral hospital in Somaliland. The country has no blood donation policy or blood donation organizations. The health sector receives large amounts of assistance from international organizations. There are 17 institutions that offer tertiary level education [9]. The University of Hargeisa (UOH) is largest public university in the country located in the capital. The institution was founded in 2000. It has over 5000 students, and operates on a four to seven year system. The university consists of 12 faculties namely Faculty of Economics and Political Science, Faculty of Information and Communication Technology (ICT), Faculty of Law and Legal Clinic, Faculty of Engineering, Faculty of Business and Public Administration, Faculty of Arabic Language and Islamic Studies, Faculty of Applied Science, Faculty of Mathematics and Statistics with Management, Faculty of Education, Faculty of Health Science, Faculty of Agriculture and Veterinary, and Faculty of Social Science [10]. The study was conducted at UOH from March 1-12 2016.

Study design

An institution based cross sectional study design was used.

Sampling technique and sample size determination

The population was stratified based on their respective college and from each strata sample was drawn (based on their respective proportion) using simple random sampling technique. A two population proportion formula was used to determine the sample size using a similar study conducted in Addis Ababa [11]. The knowledge level is 83.7% and the factor associated with it was age (OR=5). This gave a sample of 172. The Attitude level was 68% and the factor associated with it was sex (OR=2.2). This gave a sample of 292. The Practice level is 23.4% and the factor associated with it was age (OR=6.5) and sex (OR=3.9). This gave a sample of 34 and 70 respectively. To increase the power of the study the maximum sample size (292) will be considered for this study Figure 1.

$$n= (Z_\alpha+Z_{2\beta})^2 \{P_1 (1-P_1 + P_2 (1-P_2)\}/ (P_1-P_2)^2$$

Where:

- n= minimum sample size
- Z_α= confidence interval usually at 95%
- $Z_{2\beta}$= 1 Power (the probability that if the two proportions differ the test will produce a significant difference) usually at 80%

- P_1= level of attitude at 68% or 0.68
- P_2= level of factor associated with attitude (sex) at 82% or 0.82 calculated in the following manner:

$P_2 = \omega P_1 / \omega P_1 + (1-P_1)$…..

Where ω = odds ratio (OR = 2.2)

$P_2 = 2.2 (0.68) / 2.2(0.68) + (1-0.68) = 0.82 \; or \; 82\%$

$n = (1.96 + 0.84)^2 \times \{0.68(1-0.68) + 0.82(1-0.82)\} / (0.68-0.82)^2$

n = 146 is the minimum sample size for one proportion.

Therefore the sample size for two proportion is 146 × 2 = 292
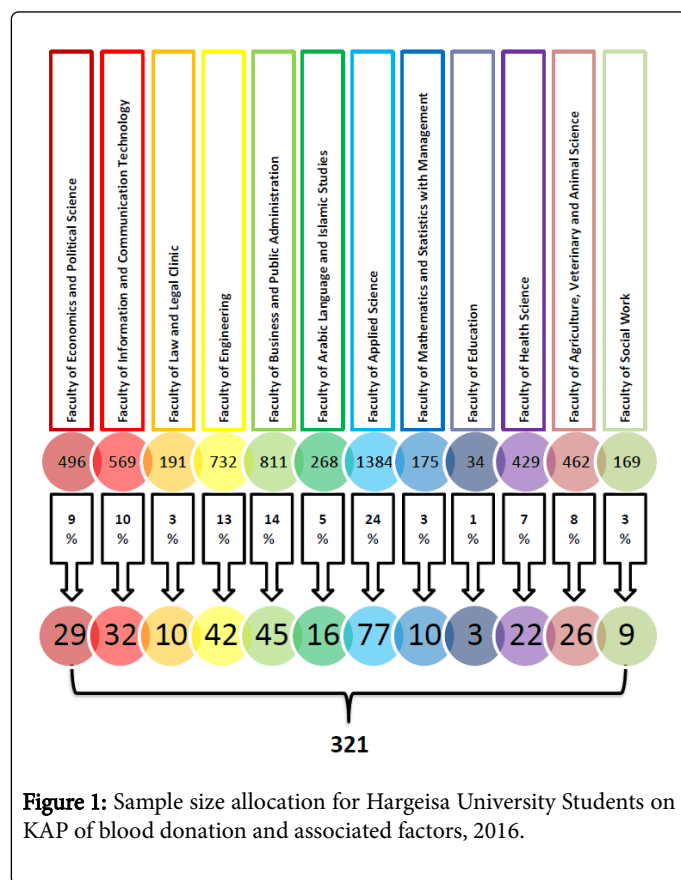

Figure 1: Sample size allocation for Hargeisa University Students on KAP of blood donation and associated factors, 2016.

Data collection process

Data were collected using self-administered questionnaire which consisted of 37 questions drafted from similar studies conducted in different places. The questionnaire is subdivided into four parts; part 1 focused on socio-demographic factors of the participants, while parts 2-4 measured knowledge, attitude and practice. Data facilitators each from 2nd and 3rd year were recruited for data collection. Third year students supervised while second year student facilitated. One day training was given by principle investigators to the data facilitators and supervisors prior to data collection. The training focused on understanding the meaning of each question, obtaining consent, keeping confidentiality of the information they gathered and quality of data collection. Emphasis was given on the significance and the appropriate meanings of each question as well as how to explain for the participants in understandable manner if required.

Data quality management

To ensure data quality management the following procedures were considered:

- For ensuring data quality the questionnaire was prepared first in English, translated to Somali, and then re-translated back to English by professional translator to check its consistency.
- The questionnaire was pretested on 10% of sample number (34 students) to check the validity of the questionnaire and necessary modification was made on the instrument. Participants who were involved in the pilot study were excluded in the actual study analysis.
- Cronbach's alpha was used to measure the reliability of the tools used to collect data. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. Although the standards for what makes a "good" α coefficient are entirely arbitrary and depend on your theoretical knowledge of the scale in question, many methodologists recommend a minimum α coefficient between 0.65 and 0.8 (or higher in many cases); α coefficients that are less than 0.5 are usually unacceptable [12]. The Cronbach alpha for this study was 0.68.
- Questionnaire was checked thoroughly for its validity before it was distributed to respondents.
- At time of data collection, filled questionnaires were checked for completeness and consistency of information by the supervisor.
- Data were also checked for uniformity and completeness before entry into computer software for analysis.
- Random sample of 30% were re-entered into the double entry feature of Epi-data version 3.1 to check the consistency of the entered data.
- Multivariate logistic regression was used to control the effect of confounding.

Data processing and analysis procedure

The collected data was checked for its completeness, consistency and accuracy before analysis. A scoring mechanism was used to understand knowledge, attitude and practice level on blood donation. Each right response was given a score of 1 while a wrong, unsure or blank response was scored 0. Knowledge on blood donation was assessed using a 9-item questionnaire Total knowledge scores ranged between 0-14. Higher points indicate good knowledge. In order to identify whether students are able to answer at least half of the questions; those who have answered above the median score were considered to be having adequate knowledge and were given a score of 1. The rest were categorized as inadequate knowledge and given a score of 0.

Attitude on blood donation was assessed using a 12-item questionnaire. Total attitude scores ranged between 0-12. Higher points indicate favorable attitude. Those who have answered above the median score were considered to be having favorable attitude and were given a score of 1. The rest were categorized as unfavorable attitude and given a score of 0. Practice was assessed based on whether or not a person has donated blood. The score for a respondent who donated blood was 1 and was categorized as having good practice. If a respondent had never donated blood the score given was 0 and was categorized as bad practice. The collected data was cleaned, coded and entered into Epi Data version 3.1 and then exported to SPSS version 20 for analysis. The data obtained was tabulated and analyzed in terms of

the objectives of the study using descriptive and inferential statistics. The plan of data analysis is as follows:

Descriptive statistics

- Frequency and percentage were used to assess the Socio-Demographic data and level of knowledge, attitude and practice.

Inferential statistics

- Bivariate logistic regression was used to determine the relationship of predictor on outcome variables.
- A multivariate logistic regression was used to examine the effect of two or more independent variables on a single dependent variable to test the statistical significance at 95% confidence level. P-value of <0.25 identified in bivariate analysis was considered as candidate for multivariate logistic regression; and again a P-value ≤ 0.05 at multivariate logistic regression will be considered statistically significant. Backward likelihood ratio of multivariate logistic regression was employed.

Ethical consideration

Ethical clearance was obtained from the Research Review Board (RRB) of Jimma University, College of Health Science. Secondly, research permission was obtained from Research and Community Directorate of Hargeisa University. In addition, verbal consent was obtained from all study subjects to ensure that participation was on voluntarily basis. On top of that, to keep the anonymity of study participants, code numbers rather than personal identifiers was used. Finally, all questionnaires were kept locked after data entry completion.

Results

Baseline characteristics

Out of 321 students 311 agreed to participate in the survey making the response rate 97%. The age of the respondents ranged from 17-30 years with mean age of 21.51 and Standard deviation of ± 2.298 years. Of the total participants, 172(55.3%) were males. The Majority of the respondents 297(95.5%) were single. Regarding their field (i.e. Science or Arts) and stream (Medical or Non-Medical), 174(55.9%) of the students were majoring in Science and 81(26%) were Medical students. Faculty with largest number of students was the faculty of Science. Table 1 shows the baseline characteristics of the respondents.

One hundred and forty five (46.6%) of the respondents had adequate knowledge regarding blood donation. A total of 204(65.6%) respondents knew the common blood groups, and 232(74.6%) mentioned their own blood group. Almost half of the respondents 150(49.2%) knew the normal volume of blood in an average healthy adult.

Regarding donor eligibility requirements, 81(26%), 60(19.3%) and 33(10.6%) of the students answered correctly for the age, hemoglobin and weight level required for blood donation respectively. Similarly, 104(33.4%) and 88(28.3%) of the respondents knew the maximum amount of blood to be donated and minimum interval between two blood donation respectively.

Characteristics		Frequency (n=311)	Percentage (%)
Sex	Male	172	55.3
Marital status	Single	297	95.5
Stream	Science	174	55.9
Field	Non-medical	230	74
College	Economics	29	9.3
	ICT	31	10
	Law	9	2.9
	Engineering	40	12.9
	Business and Public Administration	42	13.5
	Islamic Studies	15	4.8
	Applied Science	77	24.8
	Mathematics, Statistics with Management	9	2.9
	Education	2	0.6
	Health Science	22	7.1
	Agriculture, Veterinary and Animal Science	26	8.4
	Social Science	9	2.9

Educational Year	Year I	91	29.3
	Year II	75	24.1
	Year III	77	24.8
	Year IV	60	19.3
	Year V and above	8	2.6

Table 1: Baseline characteristics of undergraduate students in Hargeisa University, 2016 Level of knowledge on blood donation.

The majority of the respondents had good knowledge of who should and who should not donate blood; however, there are some misconceptions on both groups. For instance 23(7.4%), 15(4.8%), 8(2.6%) and 8(2.6%) of the respondents answered that people younger than 18 years, greater than 60 years, diseased and vulnerable groups should donate blood; while 37(11.9%), 137(44.1%) and 44(14.1%) of the respondents answered that men, woman, and healthy people should not donate blood.

Regarding indications of blood transfusion, 84(27%) could not answer any condition, 129(41.5%) gave one correct reason, 72(23.2%) gave two correct reasons, 23(7.4%) gave three correct reasons and 3(1%) gave four correct reasons. Frequently mention reasons where people with illness such as anemia, patients undergoing surgery or pregnancy and people with serious injuries. Most of the respondents 231(74.3%) were aware of the risk of transmission of infection by transfusion. The risk of transmission of HIV was affirmed by 281(90.4%), Hepatitis B Virus 206(66.2%), Hepatitis C Virus 95(30.5%), Syphilis 96(30.9%) and Malaria 100(32.2%). Table 2 shows the details of knowledge of blood donation expressed by respondents.

Question	Option	Frequency (311)	Percentage (%)
Do you know your blood group?	Yes	232	74.6
What is the normal volume of blood in an average healthy adult?	3 liters	20	6.4
	4 liters	27	8.7
	5 liters	153	49.2
	Don't Know	111	35.7
Who can donate blood?	Persons b/w 20-40 years	168	54
	Persons b/w 30-50 years	15	4.8
	Persons b/w 18-60 years	81	26
	Don't Know	47	15.1
What should be the hemoglobin level for a person to donate blood?	Not less than 10.5 mg/dl	30	9.6
	Not less than 11.5 mg/dl	16	5.1
	Not less than 12.5 mg/dl	60	19.3
	Don't Know	205	65.9
What should be the body weight for a person to donate blood?	Not less than 55 kg	106	34.1
	Not less than 50 kg	77	24.8
	Not less than 45 kg	33	10.6
	Don't Know	95	30.5
What is the amount of blood withdrawn during a single blood donation?	Less than 500 m/l	104	33.4
	Between 500-1000 m/l	110	35.4
	Greater than 1000 m/l	14	4.5
	Don't know	83	26.7

Question	Option	Frequency (311)	Percentage (%)
How often can donation be done?	Once in every 2-3 months	88	28.3
	Twice in every 2-3 months	31	10
	Once in every 6 months	99	31.8
	Don't know	93	29.9
Question	Option	Frequency (311)	Percentage (%)
Who should donate?	Men	259	39.8
(multiple response question)	Women	71	10.9
	Younger than 18 years	23	3.5
	Greater than 60 years	15	2.3
	Healthy	267	41
	Diseased	8	1.2
	Vulnerable groups	8	1.2
Who should not donate?	Men	37	4.4
(multiple response question)	Women	137	16.2
	Younger than 18 years	121	14.3
	Greater than 60 years	122	14.4
	Healthy	44	5.2
	Diseased	220	26
	Vulnerable groups	165	19.5
Can a person be infected by receiving blood transfusion?	Yes	231	74.3
	No	52	16.7
	Don't know	28	9
What diseases are transmissible by blood transfusion?	HIV	281	36.1
(multiple response question)	HBV	206	26.5
	HCV	95	12.2
	Syphilis	96	12.3
	Malaria	100	12.9

Table 2: Level of knowledge on blood donation among undergraduate students in Hargeisa University, 2016.

Factors associated with knowledge on blood donation

Bivariate analysis identified field of study (medical), faculty and educational year as potential candidates for multivariate logistic regression. After controlling for the effects of potentially confounding variables using multivariate logistic regression, only field of study was found to be a statistically significant predictor level of knowledge. Students majoring in the medical field were 3 times [AOR: 2.591, 95% CI: 1.518, 4.422] more likely to be more knowledgeable relative to students majoring in non-medical field. The Table 3 shows the details of factors associated with knowledge level of blood donation.

Variable	Knowledge		COR	95% CI		AOR	95% CI	
	Adequate knowledge	Inadequate knowledge		Upper limit	Lower limit		Upper limit	Lower limit

Age		145	166	1.045	0.948	1.152	-	-	-
Sex	Male	82	90	1.099	0.702	1.721	-	-	-
	Female	63	76	1			-	-	-
Field	Medical	52	29	2.641	1.562	4.466	2.591	1.518	4.422
	Non-medical	93	137	1	-	-	1	-	-
Faculty	Economics	10	19	1	-	-	-	-	-
	ICT	13	18	1.372	0.482	3.908	-	-	-
	Law	2	7	0.543	0.095	3.118	-	-	-
	Engineering	23	17	2.571	0.956	6.915	-	-	-
	Buss and Public Admin	18	24	1.425	0.535	3.796	-	-	-
	Islamic	6	9	1.267	0.35	4.582	-	-	-
	App Sci	47	30	2.977	1.22	7.265	-	-	-
	MSM	4	5	1.52	0.332	6.96	-	-	-
	Health Science	11	11	1.9	0.612	5.902	-	-	-
	Agri, Vet and Animal Science	7	19	0.7	0.22	2.225	-	-	-
	Social Science and Edu	4	7	1.086	0.255	4.617	-	-	-
Year of study	Year I	44	47	1	-	-	1	-	-
	Year II	39	36	1.157	0.628	2.133	1.144	0.612	2.139
	Year III	26	51	0.545	0.291	1.019	0.552	0.291	1.047
	Year IV	30	30	1.068	0.557	2.05	1.151	0.591	2.24
	Year V and above	6	2	3.205	0.614	16.72	2.728	0.505	14.748
*Indicates statistical significant association									

Table 3: Factors associated with knowledge level on blood donation among undergraduate students in Hargeisa University, 2016.

Attitude towards blood donation

One hundred and forty six (46.9%) of the respondents had favorable attitude towards blood donation. Three hundred (96.5%) respondents said that blood donation is a good thing to do. Voluntary donation was accepted as the best source of blood by 271(87.1%), replacement donor by 17(5.5%), remunerated by 2(0.6%) and the remaining 21(6.8%) had no knowledge of It. fifty eight (18.6%) of the respondents said that blood donation had adverse effect on the donor, 150(48.2%) disagreed with the above notion while 103(33.1%) were uncertain. In relation with the above question; 145(46.6%), 63(20.3%) and 101(32.5%) of the respondents stated that a donor might become weak, contract infection and fall sick respectively. From the total respondents, 242(77.8%) of the respondents said that patients relative should be asked to donate blood; and that 277(89.1%) agreed that relatives should be encouraged to donate blood. Regarding to their willingness to donate blood, 254(81.7%) respondents were ready to donate if called upon or reminded to do so. Table 4 shows the detail attitude level of respondents regarding to blood donation.

Question	Option	Frequency (311)	Percentage (%)
Blood donation is good thing to do?	Yes	300	96.5
	No	2	0.6
	Don't know	9	2.9
What do you think is the best source of blood donation?	Voluntary	271	87.1

	Replacement	17	5.5
	Remunerated	2	0.6
	Don't know	21	6.8
Only males are allowed to donate?	Yes	155	49.8
	No	92	29.6
	Don't know	64	20.6
Only physically strong people should donate?	Yes	28	9
	No	195	62.7
	Don't know	88	28.3
Blood donation can lead to anemia?	Yes	130	41.8
	No	74	23.8
	Don't know	107	34.4
Blood donation can lead to reduced immunity?	Yes	127	40.8
	No	82	26.4
	Don't know	102	32.8
Blood donation has adverse effect on the donor?	Yes	58	18.6
	No	150	48.2
	Don't know	103	33.1
Blood donation cause weakness?	Yes	145	46.6
	No	94	30.2
	Don't know	72	23.2
Blood donation can cause infection?	Yes	63	20.3
	No	136	43.7
	Don't know	112	36
Blood donation can cause a person to fall sick?	Yes	101	32.5
	No	122	39.2
	Don't know	88	28.3
I am scared of donating blood?	Yes	117	37.6
	No	165	53.1
	Don't know	29	9.3
A patient's relative should be asked to donate?	Yes	242	77.8
	No	42	13.5
	Don't know	27	8.7
Will you donate if called upon or reminded to do so?	Yes	254	81.7

Table 4: Attitude level on blood donation among undergraduate students in Hargeisa University, 2016.

Factors associated with attitude towards blood donation

Bivariate analysis identified field of study (Medical) and being a student at the faculty of Applied Science, Health Science and Social Science as potential candidates for multivariate logistic regression. Being a student at the faculty of Applied Science, Health Science and Social Science showed statistical significant association in the multivariate analysis. Students in the faculty of Applied Science, Health Science and Social Science were 3, 4, 10 times [AOR: 2.8, 95% CI: 1.136, 6.956, AOR: 3.8, 95% CI: 1.205, 12.554 and AOR: 10.00, 95% CI: 1.786, 55.976] more likely to have positive attitude towards blood donation relative to students in the faculty of Economics. Table 5 shows details of factors associated with attitude level of blood donation.

Variable		Attitude		COR	95% CI		AOR	95% CI	
		Favorable attitude	Unfavorable attitude		Upper limit	Lower limit		(Upper limit	Lower) limit
Age		146	165	1.018	0.924	1.122	-	-	-
Sex	Male	81	91	1.013	0.647	1.586	-	-	-
	Female	65	74	1	-	-	-	-	-
Field	Medical	47	34	1.829	1.095	3.054	-	-	-
	Non-medical	99	131	1	-	-	-	-	-
Faculty	Economics	9	20	1	-	-	1	-	-
	ICT	9	22	0.909	0.301	2.744	0.909	0.301	2.744
	Law	4	5	1.778	0.384	8.228	1.778	0.384	8.228
	Engineering	21	19	2.456	0.902	6.69	2.456	0.902	6.69
	Business and Public Admin	19	23	1.836	0.679	4.96	1.836	0.679	4.96
	Islamic	4	11	0.808	0.202	3.24	0.808	0.202	3.24
	Applied Sci	43	34	2.81	1.136	6.956	2.81	1.136	6.956 *
	MSM	5	4	2.778	0.6	12.856	2.778	0.6	12.856
	Health Sci	14	8	3.889	1.205	12.554	3.889	1.205	12.554*
	Agri, Vet and Animal Sci	9	17	1.176	0.381	3.634	1.176	0.381	3.634
	Social Sci and Edu	9	2	10	1.786	55.976	10	1.786	55.976*
Year of study	Year I	46	45	1	-	-	-	-	-
	Year II	33	42	0.769	0.416	1.42	-	-	-
	Year III	30	47	0.624	0.337	1.155	-	-	-
	Year IV	31	29	1.046	0.545	2.007	-	-	-
	Year V and above	6	2	2.935	0.562	15.315	-	-	-

Table 5: Factors associated with attitude level of blood donation among undergraduate students in Hargeisa University, 2016.

Practice of blood donation

Pertaining blood donation practice of participants, only thirty five students (11.3%) have ever donated blood. When it comes to the frequency of donation by donors, 23(65.7%) donated once while 12(34.3%) donated more than once. Out of total donors, only six (17.1%) donated blood on regular basis. Most 27(77.1%) donated blood because a family or a friend needed blood and 8(23.5) donated on voluntary basis. Majority of the students 276(88.7%) had never donated blood. The three frequently mentioned reason for non-donation were not approached 120(38.6%), fear of repercussion that may be caused by blood donation 72(23.1%) and lack of information 65(20.9%). Table 6 shows details of blood donation practice among students.

Bivariate analysis showed age, sex (male) and year of study (year 5 and above) as potential candidates for multivariate logistic regression. In multivariate analysis, age and sex (male) showed statistical significance association. The difference of 1 year between respondents age increases the likelihood to donate blood by 1.3 times [AOR: 1.284, 95% CI: 1.078, 1.530] keeping sex (male) constant. On the hand, males were 7 times [AOR: 7.465, 95% CI: 2.104, 26.487] more likely to donate blood as compared to females keeping age constant. Table 7 shows the details of factors associated with practice of blood donation.

Question	Option	Frequency (n=311)	Percentage (%)
Have you ever donated blood?	Yes	35	11.3
How many times have you donated blood?	1 time	23	65.7
	2-3 times	9	25.7
	4-5 times	1	2.9
	6 times or more	2	5.7
Main reason for donation?	A family or friend needed blood	27	77.1
	Voluntary	8	22.9
Main reason for non-donation?	Not approached	120	38.6
	Lack of information	65	20.9
	Need to donate for family or friend in the future	16	5.1
	Parents don't allow	16	5.1
	Unfit to donate	13	4.2
	fear of repercussion caused by blood donation	72	23.1
	Donated blood may be sold	4	1.3
	No remuneration	5	1.6

Table 6: Practice of blood donation among undergraduate students in Hargeisa University, 2016 Factors associated with practice of blood donation.

Variable		Practice		COR	95% CI		AOR	95% CI	
		Good Practice	Bad Practice		Upper limit	Lower limit		Upper limit	Lower limit
Age		35	276	1.334	1.156	1.539	1.284	1.07	1.530*
Sex	Male	32	140	10.36	3.1	34.64	7.465	2.104	26.487*
	Female	3	136	1	-	-	1	-	-
Field	Medical	9	72	0.981	0.439	2.192	-	-	-
	Non-medical	26	204	1	-	-	-	-	-
Faculty	Economics	3	26	1	-	-	1	-	-
	ICT	0	31	0	0	0	0	0	0
	Law	2	7	2.476	0.344	17.832	1.646	0.182	14.863
	Engineering	5	35	1.238	0.271	5.653	1.411	0.29	6.861
	Buss and Public Admin	5	37	1.171	0.257	5.337	2.237	0.445	11.238
	Islamic	0	15	0	0	0	0	0	0
	App Science	5	72	0.602	0.134	2.697	1.219	0.251	5.912
	MSM	2	7	2.476	0.344	17.832	3.683	0.445	30.502
	Health Sci	5	17	2.549	0.538	12.087	2.756	0.532	14.275
	Agri, Vet and Animal Sci	8	18	3.852	0.898	16.53	3.887	0.837	18.061

	Social Sci and Education	0	11	0	0	0	0	0	0
Year of study	Year I	6	85	1	-	-	-	-	-
	Year II	5	70	1.012	0.296	3.456	-	-	-
	Year III	12	65	2.615	0.932	7.339	-	-	-
	Year IV	8	52	2.179	0.716	6.635	-	-	-
	Year V and above	4	4	14.167	2.819	71.183	-	-	-

Table 7: Factors associated with practice of blood donation among undergraduate student in Hargeisa University, 2016.

Discussion

Maintaining an adequate and safe supply of blood is an issue of concern to health planners, especially with the increase in demand. In this study an attempt has been made to assess the level and factors associated with knowledge attitude and practice of students on voluntary blood donation.

In this study only 46.6% of the students had adequate knowledge about blood donation. The current finding is almost similar with previous studies conducted on university students in Thailand and Ethiopia; were the knowledge level was 42.7% and 40.04% respectively [13,14]. A little over a quarter (28.4%) said that the minimum frequency of donation was every three months. This is lower than in studies conducted on health or medical students in Ethiopia and India were the rate was 40.09% and 59.63% respectively [11,15]. The reason may be perhaps in the above studies the participants were exclusively medical or health students; while in this study, participants come from both medical and non-medical colleges. Being a student in the medical field was found to be a significant predictor of level of knowledge.

In this study, less than half of the respondents (46.9%) had favorable attitude towards blood donation. This is comparable to a study conducted on regular students in Ambo University, Ethiopia, were the rate was 47.7% [14]. Almost all of the respondents (96.5%) said that blood donation is a good thing to do which is slightly higher than studies conducted on students in Kathmandu (82.5%) and two studies conducted in Nigeria on physicians (89%) and health care workers (81.6%) in the University of Benin Teaching Hospital [16-18]. Eighty two percent of the respondents were ready to donate blood if called upon or reminded to do so. This is smaller than a study conducted on health students in Addis Ababa University; were the figure was 100% [11]. This may be due to the fact that large number of females believes that they are not eligible or not allowed to donated blood. Being a student in the faculty of Social Science was found to be significant predictor of attitude towards blood donation.

Less than one quarter, (11.3%) of the respondents has ever donated blood. This is comparable to WHO report on percentage of blood donors among WHO African countries, which categorized Somalia in the lowest group. This supports that blood donation rates are considerably less in developing countries when compared to developed countries [6]. The major reason for those who have donated blood was a family or friend needed blood (76.5%). This is greater than in a study conducted among university students in Saudi Arabia 30% [18]. The main reason may be because the only source of blood donation in Somaliland is replacement and people occasionally donate blood voluntarily. The major reason for non-donation were not approached to donate (39.5%) and no information as to when, where or how to donate (21.1%). Age and sex (male) was found to be significant predictor of practice towards blood donation. This is similar to a study conducted on health science students in Addis Ababa University were age and sex were also significant predictors of blood donation practice [11].

Even though these students represent a large healthy source of blood donation, this clearly shows that there is a serious need for sensitization and education to all; and to encourage them to go to the blood bank for blood donation.

Conclusion

This study revealed the student's level of knowledge about blood donation in Hargeisa University is very low; above half of the respondents have adequate knowledge on blood donation with significant predictor of level of knowledge was field of study (belonging to a medical field). Similarly, more than half of the respondents had unfavorable attitude towards voluntary blood donation and factors associated with attitude was faculty (being a student at the faculty of Applied Science, Health Science and Social Science).

Finally, this study identified that blood donation practice was very low. Small number of the respondents had ever donated blood. Significant predictors of blood donation were age and sex (male). This reflects that KAP of students towards blood donation were affected by different socio-demographic characteristics of the respondents. These factors should be emphatically considered during blood donation program development.

Recommendation

Since youth represent the largest share of Somaliland's population and since many of them could be found in the universities; and in order to solve and overcome blood shortages in this country and based on the findings of this study the following recommendations are suggested:

- Regional Red Crescent should use school mini media, Radio, TV programs to create awareness among University students, to increase knowledge, positively influence individual's unsupportive attitude toward blood donation. Informing audience during health education to consider higher institutions periodic sensitization, and addressing the place where voluntary blood donation was taken place.
- Employing educated individuals and political leaders in the University by participating in voluntary blood donation to break

the poor attitude of students toward blood donation could be some solutions.

- Ministry of health in collaboration with Hargeisa Group Hospital would be better to strengthen working on voluntary blood donation by using mass media, school health education and provide counseling for those who donated blood on the center for replacement or voluntary and also extended emphasis to University students to encourage educated people and particularly students to donated blood regularly to solve shortage blood in the country.

- As baseline data to Understanding what Somalilanders know and what they do in terms of voluntary blood donation will serve the local authorities in planning and implementing measures to improve the national blood program, including the education, recruitment and service of donors.

Author's Contributions

Abdirahman Omer Ahmed: Conceptualized the study, designed the study instrument, conducted the data collection and analysis and wrote the first draft and final draft of the manuscript.

Competing Interests

The author declares that there is no competing interest.

Acknowledgements

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