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Knowledge, Attitude and Practice on Voluntary Blood Donation and Associated Factors among Ambo University Regular Students, Ambo Town, Ethiopia

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Abstract

Availability of blood for transfusion is limited in Ethiopia, as is voluntary blood donation. Evidence relating to knowledge, attitudes and practices on blood donation among Ethiopians is also scarce. Because University students represent an important group of potential blood donors, we investigated what socio-cultural factors may be important to consider for promoting voluntary blood donation among them.

Methods: Cross-sectional facility based quantitative study method was employed among Ambo university regular students from April 5-15, 2014. The study participants were selected by using simple random sampling technique. A pre-tested structured questionnaire was used to collected data. Both bivariate and multivariable logistic regressions were used to identify associated factors.

Result: The proportion of students having good knowledge blood donation was 40.4% and significantly associated with source of information from health facility [(AOR=24.72, 95%CI: 7.18-85.09], mass media [AOR=10.28-95%CI: 2.92-36.18] and family education [AOR=13.04, 95%CI: 3.82-44.55], sex [AOR=1.7, 95%CI: 1.08-2.68], faculty of natural science [AOR =1.98, 95% CI: 1.20-3.25 and residence [AOR=2.24-95%CI: 1.43-3.53].

The positive attitude of the respondents towards blood donation were 47.4% and significantly associated with family education [AOR=2.46, 95%CI: 1.44-4.21], Academic year [AOR=2.4, 95%CI: 1.26-4.58] and good knowledge [AOR=2.16, 95%CI: 1.4-3.35].

The practiced of voluntary blood donation were 23.6% and significantly associated with family education [AOR=2.04, 95%CI: 1.19-3.48], voluntary blood donors [AOR=3.16, 95%CI: 1.03-9.66], family member received blood [AOR=2.24, 95%CI: 1.31-3.81] and good knowledge [AOR=2.96, 95%CI: 1.78-4.92].

Conclusion and recommendation: Majority, 59.6% had poor knowledge and more than half (52.3%) of the study participants had unfavorable attitude towards voluntary blood donation and 76.4% had never practiced blood donation yet. Therefore, Policy makers would be better to plan to increase KAP of voluntary blood donation among University students. These factors should be emphatically considered during Voluntary blood donation program development.

Keywords: Knowledge; Attitude; Voluntary blood donation; Student; Ambo University

Abbreviations: AOR: Adjusted Odd Ratio; COR: Crude Odd Ratio; ERCS NBBS: Ethiopian Red Cross Society-National Blood Bank Service; FMOH: Federal Ministry of Health; KAP: Knowledge, Attitude and Practice; SPSS: Statistical Package for Social Science; VB: Voluntary Blood Donation; WB: Whole Blood; WHO: World Health Organization

Introduction

Blood can save millions of life, and Young people are the hope and future of a safe blood supply in the world [1]. There is a considerable shortage of blood, even in large metropolises, with the supply being less than 50% of the requirement [2]. Safe blood is a critical component in improving the health care and in preventing the spread of infectious diseases globally. Millions of lives are saved each year through blood transfusions, but yet the quality and the safety of blood transfusion is still a concern, particularly in the developing countries [2]. The reason for this includes blood collection from unsafe donors, poor laboratory procedures and the inadequate testing of blood [2]. Every year, millions of people rely on the generosity of another person to donate blood. Yet, blood donation rates vary considerably and the demands for blood and blood products are increasing worldwide [3]. To meet these needs, more people must come forward to give blood voluntarily, and regularly, says the WHO on World Blood Donor Day "In addition, some blood products used to treat cancer patients, like platelets, have a shelf-life of only five days [2]. This showed that increasingly need more blood donors to meet these demands [3]. 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 [3].

The need for blood and blood products is rising in all parts of the world. Uncontrolled bleeding accounts for more than 468,000 deaths per year [3]. In low-income countries where diagnostic facilities and treatment options are limited, the majority of transfusions are prescribed for the treatment of complications during pregnancy and childbirth, the management of severe childhood anemia, trauma and congenital blood disorders. In many situations, current systems are unable to meet the needs, while expansion of health coverage and improved access to health services further increases these demands [3]. Around 107 million units of blood donations are collected globally every year. Nearly 50% of these blood donations are collected in high-income countries, home to 15% of the world's population. About 10,000

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blood centers in 168 countries report collecting a total of 83 million donations. Collections at blood centers vary according to income group [4]. The median annual donations per blood centre is 3100 in the low- and middle-income countries, as compared to 15,000 in the high-income countries [4].

The median blood donation rate in high-income countries is 39.2 donations per 1000 population. This compares with 12.6 donations in middle-income countries and 4.0 donations in low-income countries [4].

Quarter million maternal death in the world and 15% of child mortality in Africa was due to obstetric bleeding and anemia, respectively, in which blood transfusion is always required [5]. However, annually 81 million units of blood are collected all over the world. Despite of this fact, only 27 million are collected in low- and middle-income countries, whereby 82% of the world's population lives [6].

In Sub-Saharan Africa (SSA) out of the estimated need of 18 million units of safe blood per year, merely about 15% were collected [5]. Ethiopia is with high maternal mortality 676/100,000 [7] and high motor accident (among ten top countries in the world) and with a large non immune population for malaria. However, only 24,000 units were collected in 2004 (i.e. 0.3 units/1000 people) and of these 71% were collected from Addis Ababa [5]. This indicates the severe shortage of blood supplies for the vast majority of the population (about 96%) residing outside Addis Ababa [5].

Youngsters are the most potential blood donors in every society and students constitute a huge portion of them. This research focuses on the student's knowledge, attitude and practice towards blood donation among University students may vary by individual, social and demographic characteristics are not well understood. Moreover to our knowledge there have been no studies conducted on knowledge, attitude and practice towards blood donation among University students in Ethiopia.

Methods and Materials

Study setting

The study was conducted from April 5-15, 2014, in Ambo University main campus which found in Ambo Town, West Shoa Zone and Oromiya Regional State in western part of Ethiopia and 125 Kilo meters west of Addis Ababa. Ambo University is one of the pioneer Universities in Ethiopia offering multidisciplinary fields of study in post graduate, under graduate and continuous education program. It's has 3 campuses including the main campus. The regular students who learn in Ambo University are 10338 in which the number of male students is 7482 and the number of female students was 2856. There is 9 faculties and 38 departments under the university in academic year of 2013/14GC.

A well-structured validated and pretested questionnaire with 82% repeatability rate was used to assess the knowledge, attitude and practice about voluntary blood donation. Questionnaire consist of three sections; practice, knowledge and attitude. Blood donation practice was assessed through nine questions addressing the nature of donation, frequency of donation, reasons for not donating blood etc. Knowledge part contains 14 questions; knowledge on blood donation was assessed through questions covering benefits, requirements and restrictions of blood donation. The attitude for blood donation was assessed through ten questions with 'agree' and 'disagree' options. A scoring mechanism was used to understand overall knowledge level; a score of one has given for each correct response and zero for wrong response.

According to this study respondents with all correct response get above the mean value, higher points indicate good knowledge and score less than the mean value indicated Poor knowledge. Based on total score, knowledge level on voluntary blood donation was categorized into good and poor knowledge based mean value.

Respondents with all correct response of agree get above the mean value, higher points indicate above the mean value were considered as had Positive attitude towards blood donation while those who scored below the mean value they were considered as had Negative attitude towards voluntary blood donation.

Practice of blood donation means that the condition in which the study subject was volunteer donated blood regardless of the time and the place of donation before/previously.

Study design

A facility based cross-sectional study design with quantitative data collection methods was employed. The study inclusion criteria were having attended for at least 1st year, regular students of the academic year 2013/14 in main and Awaro campus of Ambo University and availability of Ambo University ID card and willingness to consent for participation in the study.

Sampling procedure and sample size determination

Sample size was determined by using an assumption of the proportion of good knowledge was 50% among Ambo University student with a confidence level of 95% and marginal error of 5% and by using a single population proportion formula. By considering 10% non-response rate, the final sample size was 423.

A list of regular undergraduate students of main and Awaro campus were prepared and entered into computer SPSS window 16.0 version from office of registrar then, selected by simple random sampling technique by proportionally allocated to each faculty. Five day (5 day) before data collection started the list of randomly selected students ID number was posted on notice boards and cafeteria for calling students for data collection at great hall and facilitators cross-check students' ID number with sampled ID number.

Data collection procedures

Data were collected by self-administered questionnaire by using structured, pre-tested English version questionnaire. The questionnaires were prepared in English. Five well trained diploma nurses were facilitated data collection and one BSC Nurse has supervised during data collection period. Data collection facilitators had cross-checked students' ID number with sampled ID number daily. The filled questionnaires were checked for consistencies and completeness daily by supervisor and principal investigators on the spot. Pre-test of the questionnaire were done on 5% of the sample size on Woliso campus which is nearby to Ambo University main campus, to identify any ambiguity, consistency and acceptability of questionnaire, and then necessary corrections were made before the actual data collection.

Data processing and analysis

After data collection, each questionnaire was checked for completeness, edited, cleaned missed values and missed variables and data were analyzed by using SPSS software version 16 to provide frequencies and percentages for categorical variables and means and standard deviations for numerical variables and multivariate logistic regression (stepwise backward likelihood ratio method) was conducted to analyze factors that were associated with KAP towards

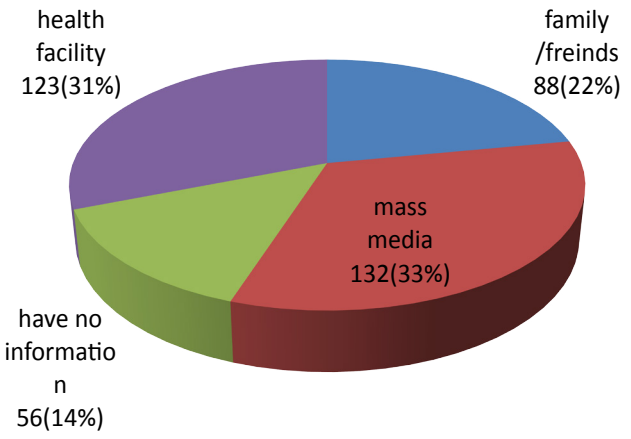

Figure 1: Distribution of primary sources of information of blood donation of Ambo University main campus 2014.

blood donation. P-value of less than 0.05 will be considered to add the variables in the equations in the process of stepwise model at 95% C.I (P-value < 0.05). The data will be summarized and the adjusted odds ratios (AORs) estimated; and their corresponding 95% confidence intervals (95% CI) are computed. The result was presented using tables, figures and narratives (Figure 1).

Ethical consideration

Ethical clearance letter is initially obtained from Ambo University research Ethical Committee. Then written consent was secured from student dean office which was provided to registrar office to get permission. Verbal informed consent for participation was obtained from each participant and the collected data were stored in a file, without the name of study participant and password protection of soft data and use of key and lock for hard copy data was employed to guarantee confidentiality.

Result

Socio demographic status of the participants

In this study, about 399 students were participated with a response rate of 94.3% (399/423). Most of the participants were male 242(60.7%). The respondents mean age was 22.09 year old which ranges from 18 to 33 years. Concerning ethnicity, majority of the respondents 222(55.6%) were Oromo followed by Amhara which account, 95(23.8%). Regarding to religion 200(50.1%) of the respondents were Orthodox followed with protestant which account 134(34.1%). Almost all of the respondents 364(91.2%) were single and only 2(0.6%) divorced/widowed.

From the total 9 faculties the proportion of technology which accounts 128 (32.1%) and the same from school of law and cooperative 12 (3%) were included in the study which directly proportion to the population size of these study participants the majority were from third year in academic which accounts 160 (40.1%). With regards to study participants' family educational backgrounds of their father's/mother's about 297 (74.4%) were illiterate in their educational status.

The primary sources of information about blood donation of study respondents showed that 132 (33%) were from mass media and only 56 (14%) were have no information about blood donation.

Knowledge of the participants about blood donation

This study determined that the level of knowledge of the students regarding to blood donation about 161 (40.4%) had good knowledge of which 85 (21.4%) and 76 (19.0%) were male and female students respectively.

Out of total respondents only 93(23.3%) were knew their blood group of which 65 (69.9%) and 28 (30.1%) were **B** and **A** group respectively.

Socio-demographic Factors associated with level of knowledge of blood donation in bivariate analysis

In the bivariate analysis, among the socio-demographic variables, sex, marital status, residence, their family educational status, academic year, faculty of the study and sources of information were found significantly associated with good knowledge about blood donation.

Factors predicting level of knowledge of blood donation of students at multivariable analysis

Associations found to be statistically significant in the bivariate analysis at a p-value <0.2 were included in the multivariable analysis to determine which factors best explained or predicted the level of good knowledge of blood donation among regular students . Using the multiple logistic regression analysis (Table 1), factors significantly predictive level of knowledge of blood donation of students included:- being female study participants were 1.7 times [AOR, (95% CI), 1.7(1.08, 2.68)] more likely to have good knowledge as compared to male students.

Study participants from natural science were 1.98 times [AOR, (95% CI), 1.98, (1.20, 3.25)] more likely to had good knowledge as compared to social science students.

This study revealed that the study participants' primary sources of information about blood donation from health facility, family/friends and mass media were 24.72, 10.28 and 13.04 times[AOR, 95% CI), 24.72(7.18-85.09)], [AOR, (95%CI), 10.28, (2.92-36.18)] and [AOR, (95%CI), 13.04, (3.82-44.55) more likely to had good knowledge as compared to had no information respectively.

This study also identified that the study participants came from urban areas were 2.24 times AOR, (95% CI), 2.24(1.43-3.53)] more likely to had good knowledge as compared to came from rural areas.

Attitude of the study participants towards voluntary blood donation

This study revealed that from the total respondents 189(47.4%) had positive attitude towards voluntary blood donation with the 95%CIof 42.4% to 52.4% among Ambo University students.

Factors predicting attitude towards blood donation of students from multivariable analysis

Associations found to be statistically significant in the bivariate analysis at a p-value <0.25 were included in the multivariable analysis to determine which factors best explained or predicted the attitude of blood donation among regular students. Using the multiple logistic regression analysis (Table 2), factors significantly predictive attitude of blood donation

This study revealed that the study participants' who have literate family were 2.46 times [AOR, 95% CI), 2.46(1.44-4.2)] more likely to donated blood voluntary as compared to have illiterate family.

The current study identified that the study participants who were above 4th year had 2.4 times [AOR, (95% CI), 2.4, (1.26, 4.58)] more likely to had positive attitude as compared to 3rd year students.

Variable		Category		Total	AOR	95% CI	P-value
Source of information of blood donation		Less knowledgeable	Good Knowledgeable				
	Have no info	53(13.3%)	3(0.8%)	56	1:00		0.00
	Health facility	55(13.8%)	68(17%)	123	24.72	7.18-85.09	0.00
	Family/friends	55(13.8%)	33(8.3%)	88	10.28	2.92-36.18	0.00
	Mass media	75(18.8%)	57(14.3%)	132	13.0	3.82-44.55	0.00
Total		238/399(59.6%)	161/399(40.4%)	399			
Sex							
	Male	157(39.3%)	85(21.3%)	242	1:00		
	Female	81(20.3%)	76(19%)	157	1.7	1.08-2.68	0.022
Total		238	161	399			
Residence							
	Rural	150(37.6%)	71(17.8%)	221	1:00		
	Urban	88(22.1%)	90(22.6%)	178	2.24	1.43-3.53	0.00
Total		238	161	399			
Faculty							
	Social sc.	84(21.1%)	37(9.3%)	121	1:00		
	Natural Sc.	154(38.6%)	124(31.1%)	278	1.98	1.20-3.25	0.007
Total		238/399(59.6%)	161/399(40.4%)	399			

Table 1: Factors associated with level of knowledge of blood donation of students' at multivariable analysis Ambo University 2014.

Variable		Category		Total	AOR	95% CI	P value
Study participant's family education		Negative attitude	Positive attitude				
	Illiterate	171(42.9%)	126(31.6%)	297	1:00		
	Literate	39(9.8%)	63(15.8%)	102	2.46	1.44-4.2	0.01
Total		210	189	399			
Academic year of the study							
	3rd year	108(27.1%)	52(13%)	160	1:00		
	1st year	33(8.3%)	31(7.8%)	64	1.5	0.78-2.85	0.34
	2nd year	45(11.3%)	73(18.3%)	118	3.52	2.1-5.92	0.000
	≥4th year	24(6.0%)	33(8.2%)	57	2.4	1.26-4.58	0.006
Total		210	189	399			
Knowledge category							
	Less knowledgeable	145(36.3%)	93(23.3%)	238	1:00		
	Good Knowledgeable	65(16.3%)	96(24.1%)	161	2.16	1.4-3.35	0.000
Total		210	189	399			

Table 2: Factors associated with attitude of students towards blood donation at multivariable logistic regression west shoa main campus Ambo University, Ethiopia 2014.

This study also showed that the respondents who had good knowledge 2.16 times [AOR, (95% CI), 2.16(1.4, 3.35) more likely to had positive attitude towards voluntary blood donation as compared to less knowledge.

Practice of the study participants of voluntary blood donation

This study determined that 94(23.6%) of the study participants were donated blood at least one times voluntarily with 95% CI of 19.3% to 28.1% respondents.

From those donated 58(14.5%) were donate before one year and 32(8%) were donated before two years.

From total respondents all the participants (100%) are willing to donate blood in the future voluntarily. From total respondents that were not donated blood were reported their major reasons for not donated 94(23.6)were due to fear or pain, 70 (17.5%) were due to safety reasons, 67(16.8%) were never thought about donating blood, 28(7%) were no one ever asked to donate blood18(4.5%) were feels medically unfit, lack of motivation14(3.5%),due to disease also the reason for 11(2.8%) were some of major reasons mentioned by study participants.

Factors predicting practice of blood donation of students from multivariable analysis

Associations found to be statistically significant in the bivariate analysis at a p-value<0.25 were included in the multivariable analysis to determine which factors best explained or predicted the practice of blood donation of students among regular students . Using the multiple logistic regression analysis (Table 3), factors significantly predictive practice of blood donation of students included.

This study revealed that the study participants' who have literate family were 2.04 times [AOR, (95% CI), 2.04(1.19-3.48)] more likely to donated blood voluntary as compared to have illiterate family.

The respondents who known paid types of blood donors had 3.16 times [AOR, (95% CI), 3.16(1.03-9.66)] more likely blood donated as compared to voluntary blood donors. The study participant's family, 'who had received blood from blood bank were 2.24 times [AOR (95% CI), 2.24(1.31-3.81)] more likely to practiced voluntary blood donation as compared to were not received blood from blood bank previously.

This study showed that the study participant who had good knowledge were 2.96 times [AOR (95%CI), 2.96(1.78-4.92)] more likely to be practice as compared to less knowledgeable respondents.

Discussion

Maintaining an adequate and safe blood supply is an issue of concern to health planners especially with the increase in demand. Therefore, understanding the practice, attitude and level of knowledge

Variable		Category		Total	AOR	95% CI	P value
		Have you ever donate blood					
		Yes	No				
Family educational status							
	Illiterate	56(14%)	241(60.4%)	297	1:00		
	Literate	38(9.5%)	64(16%)	102	2.04	1.19 -3.48	0.009
Total		94	305	399			
Types of blood donors							
	voluntary	84(21.1%)	299(74.9%)	383	1:00		
	Paid	10(2.5%)	6(1.5%)	16	3.16	1.03 -9.66	0.04
Total		94	305	399			
Family member received blood							
	No	56(14%)	244(61.2%)	300	1:00		
	Yes	38(9.5%)	61(15.3%)	99	2.24	1.31 -3.81	0.003
Total		94	305	399			
Knowledge category							
	Less knowledgeable	33(8.3%)	205(51.4%)	238	1:00		
	Good knowledgeable	61(15.3%)	100(25.1%)	161	2.96	1.78 -4.92	0.000
Total		94	305	399			

Table 3: Factors associated with voluntary blood donation practice of Ambo University main campus regular students 2014.

associated with donation is crucial. In this study only 40.4% of the students had adequate Knowledge about blood donation. The current finding was almost similar with previous studies Pondicherry India and South India showed that 37.5% and 42.7% [2,8].

The current studies revealed that source of information and residences were greatly associated with level of knowledge (p value=0.000 respectively) as compared to the previous studies which was family educational status was not significantly associated with knowledge of blood donation. This difference may be due to the fact that family's discussion about blood donation very common because of Ethiopian Red Cross-association provided health education on blood donation by mass media by using role model like political leaders and artists in their setting. Finally, the study results indicate that various mass media (i.e., TV, radio, and newspaper) tend to be useful channels that reach a wide range of potential blood donors.

Different study revealed that blood donation is completely differing by sex. Males were more likely to donated blood more than females [9,10]. The current study finding is not consistent with these findings in female participants were 1.7 times at AOR (11.08-2.68, P<0.022) more likely to had good knowledge as compared to male study participants. This could not be in congruent to cultural belief of that male are better and strong to take responsibility than female. This may be due to females spent most of their time on home as a result they had more exposure to mass medias.

In the previous study all the participants had positive feeling towards blood donation [2] and on another study conducted in south Indian showed that the prevalence of positive attitude were 87.3% [8]; in contrast to the current study was very low which is 47.4%. This difference may be due study population difference; on previous study participants were selected from medical students only, but on current study all faculties of natural and social science students were included

This study determined that female participants had more likely had positive attitude towards blood donation than male participants. Female students had good knowledge and knowledge of blood donation is a prerequisite to obtaining access to and provides blood voluntarily on timely and effective. And it is an important tool for avoiding fear and building positive attitude.

Respondent's family education level was emerged as a statistically significant predictor of positive attitude towards blood donation. When comparing those positive attitude towards blood donation to with those negative attitude toward blood donation respondents with substantial from illiterate family and literate family 2.04 times (p <0.009: 95%CI. AOR=.1.19-3.48) more likely to have positive attitude towards, this is variable is new not included on previous studies. Thus, the probability of expressing a positive attitude is weaker among more educated people. This could be due to lack of audience segmentation for providing information or applying equal motivational strategy for both educated and non-educated individuals.

In this study, among the total respondent, 23.6% had a history of blood donation, which was lower than in a study done in Saudi Arabia (34.16%) [10], Canada (43·8%) [11] and south Indian showed that 38% of the respondents were donated blood [8]. This difference could be due to there is poor social marketing toward blood donation and periodic sensitization in the study area.

Knowledge of blood donation is a prerequisite to obtaining access to and provides blood voluntarily on timely and effective. And it is an important tool for avoiding fear and building positive attitude. Controlling for other variable knowledge of blood donation emerged as a statistically significant predictor of blood donation practice while the knowledge of respondent increases their practiced to donate blood also increase at AOR [2.16, 1.4-3.35, p-value=0.01]. This finding was consistent with study done by K.P.H. Lemmens [11]. Having low proportion of blood donation in, this could be due to the fact that more than half (60%) of the participants had poor knowledge about blood donation.

On other hand types of blood donors and their family members receive bloods from blood bank were significant associated voluntary blood donation practice. This might be due to the fact that the being during blood received from blood bank they undergo extensive health education by health professionals which clear any misconception regarding to blood donation and motivated them to blood donation. On this research by considering the main strength of this research lies in its computer generated random sampling strategy for data collection, and a set of reliability and validation rules were applied and all associated factors were taken after indication of significance in the

"goodness of fit" for the models. Even though this study also had a few limitations: This study was facility-based among University students, so that the results were not generalizable to the general population in the community and cause and effect relation was not assured because of cross-section study deign.

Conclusion

This study revealed the student's level of knowledge about blood donation in Ambo University is very low; above half (59.6%) of the respondents have poor knowledge blood donation with significant predictors of level of knowledge were sources of information, sex, faculty and residence of the study respondents.

The more than half (52.3%) of the study participants had unsupportive attitude/negative attitude towards voluntary blood donation and factors associated with attitude of study respondents were knowledge of the participants, their family's educational status and academic year respectively.

Final this identified that the voluntary blood donation practiced among Ambo University students were very low which was 23.6% with significant predictor of voluntary blood donation were: family educational status; types of blood donors, family member receive blood and knowledge of the participants about blood donation respectively. This reflects that KAP of students toward voluntary blood donation were affected by different socio-demographic characteristics of the study respondents, their family education status and history their family's blood received from Red Cross. These factors should be emphatically considered during Voluntary blood donation program development.

As recommendation, it is important that the regional Red Cross should use school mini media, Radio, TV programmes 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.

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.

Ethiopia Red Cross 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 donation 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 Ethiopians know and what they do in terms of VBD will serve the local authorities in planning and implementing measures to improve the national blood program, including the education, recruitment and service of donors

Authors' Contributions

Abnet Nigatu: Conceptualized the study, designed the study instrument and conducted the data analysis and wrote the first draft and final draft of the manuscript.

Dereje Bayissa: Approved the proposal with some revisions, participated in data analysis, revised subsequent drafts of the paper and involve in critical review of the manuscript. All authors read and approved the final manuscript.

Competing Interests

The author(s) declare that they have no competing interests.

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