

DOI: 10.21767/1791-809X.1000542

Knowledge, Attitude, Practice and Associated Factors towards Voluntary Blood Donation among Regular Health Science Students of Samara University, Ethiopia

Woldemichael Tadesse¹, Yohannes Ayalew², Engida Yisma², Misgan Legesse Liben^{3*} and Mesfin Wudu⁴

¹Department of Nursing, College of Medical and Health Sciences, Samara University, Afar, Ethiopia

²Department of Nursing and Midwifery, School of Allied Health Sciences, College of Health Sciences, Addis Ababa University, Addis Ababa, Ethiopia

³Department of Public Health, College of Medical and Health Sciences, Samara University, Afar, Ethiopia

⁴Department of Public Health, Woldia University, Amhara, Ethiopia

*Corresponding author: Misgan Legesse Liben, Department of Public Health, College of Medical and Health Sciences, Samara University, Afar, Ethiopia, Tel: 251 913340321; E-mail: lmisgan@yahoo.com

Received date: 15 November 2017; Accepted date: 04 January 2018; Published date: 12 January 2018

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Citation: Tadesse W, Ayalew Y, Yisma E, Liben ML, WuduM (2017) Knowledge, Attitude, Practice and Associated Factors towards Voluntary Blood Donation among Regular Health Science Students of Samara University, Ethiopia. Health Sci J. Vol. 12 No. 1: 542.

Abstract

Background: In spite of, extensive efforts and a number of blood donation programs being organized worldwide, availability of adequate and safe blood still remains short to meet the increased demand in developing countries including Ethiopian. The major challenge was recruitment of voluntary, non-remunerated blood donors. Literatures identified that many factors are responsible such as, lack of knowledge, negative attitudes, and inconvenience for facilities. Increase level of knowledge and positive attitude towards voluntary blood donation in young people is highest priority.

Methods: Institutional based cross-sectional quantitative study was used to assess KAP and associated factors towards voluntary blood donation (VBD) among health science students of Samara University, Afar Northeast Ethiopia, using pre-tested structured self-administered questionnaire. Stratified sampling method was used and individual was selected by simple random sampling method. Data was analyzed by SPSS version 20.0. Logistic regression analysis was used to identify associated factors. Predictor variables with p-values up to 0.25 in bivariate regression were entered to multivariate regression and p-value <0.05 used as cut-off point for a variable to become independent predictor. Association b/n outcome and predictor variables were calculated by odds ratio and 95% CI. Finally, results were presented in texts, graphs and tables.

Result: Out of total participants, 67% were males and mean age range, 21.29 ± 1.66 years. Of them, 54% (95%

[CI]: 49.0%-59.0%) of participant had adequate knowledge regarding VBD. Being students in department of midwifery increased odds of level of knowledge on VBD [AOR (95%CI)=1.95(1.02, 3.7)]. Of total, students 65.8% (95% [CI]: 61.0%-71.0%) had favorable attitude. Being students in department of midwifery and health officer increased odds of favorable attitude [AOR (95% CI)=1.943(1.066, 3.542) and 2.099(1.207, 3.649)] respectively. Less than one quarter, 83 (24.5%) (95% [CI]: 20.0%-29.0%) had ever donated blood. Being department of nursing increased odds of practice [AOR (95%CI)=1.881(1.002, 3.532)].

Conclusion: The level of knowledge on VBD was low while, significant number of students had unfavorable attitude towards VBD and there was poor practice. Therefore, it is better to incorporate short training course for health science students in the existing curriculum.

Keywords: Voluntary blood donation; Health science students

Abbreviations and acronyms: AAU: Addis Ababa University; AIDS: Acquired Immune Deficiency Syndrome; AOR: Adjusted Odd Ratio; BD: Blood Donation; CI: Confidence Interval; COR: Crude Odd Ratio; HBV: Hepatitis B Virus; HCV: Hepatitis C Virus; HIV: Human Immune Virus; KAP: Knowledge Attitude and Practice; SPSS: Statistical Package Software for Social Science; TTI: Transfusion Transmissible Infection; VBD: Voluntary Blood Donor

Methods

Study setting and subjects

The study was conducted in Samara University College of health science regular under graduate students Afar Northeast Ethiopia. An institutional based cross-sectional quantitative study design was used, and self-administered questionnaire data were collected from regular undergraduate health science students. The study was conducted during the period from February 21, 2016 to March 8, 2016. All regular health science students who attend their education in Samara University were included in the study [19].

Sample size and sampling

Sample size was estimated using a single population proportion formula and it was calculated with the following assumptions: The proportion for this study was taken from previous study using knowledge level is 83.7%, attitude 68% and practice 23.4% [24], at $\alpha=0.05$ 95% confidence level ($Z_{\alpha/2}=1.96$) and absolute precision or margin of error to be 5% ($d=0.05$) and a 5% anticipated non-response rate. Based upon the above assumptions, the proposed sample size for this study was 351 [20,21].

Data collection instruments and procedures

Pre-tested structured self-administered questionnaire prepared in English was used in gathering relevant information. The data collection tool was adopted from WHO tools for assessing practices of voluntary blood donation and accordingly from previous studies [4,8,13,17,22] with required modification based on outcome variables and their predictors. The instrument was designed to obtain information about socio-demographic characteristics, knowledge of undergraduate health science students about blood and VBD, attitude, practice and identifies associated factors. In order to produce a more objective assessment a scoring mechanism was used. To understand overall knowledge level, a score of one has been given for each correct response and zero for wrong response. For attitude part, which was designed as 'Yes' and 'No' items, accounts a maximum of ten correct answer. A score of one given for correct answer and zero for wrong answers were used. Before the commencement of actual data collection, the data collectors were trained. The training session included the internalization of the objective of the survey, technique and how to approach the respondents. During the training session, a few questions were paraphrased to make them more understandable. During the actual data collection, the investigators supervised data collectors. The sample was stratified based on their department and from each strata member was drawn by using simple random sampling technique. After random selection of their identification numbers from each department independently those selected individuals were arranged based on their class year and data collection was assigned at each class. Participants were oriented about the objective of the study, why and how they were selected, about confidentiality and

voluntary participation, and how to respond to the questionnaire. The data collection was facilitated by data collectors and the investigator.

Study variables

The dependent (outcome) variables for this study were "Level of knowledge: which defined as the understanding level of students about blood and the benefits, risks, eligibility criteria of blood donation. Based on total score, using 22 major questions with 42 right answers knowledge level on VBD was categorized into adequate knowledge and inadequate knowledge" "Those who answered 50th percentile and above classified as knowledgeable and inadequate knowledge for those participants whose response was less than 50th percentile (median) from questions asked in knowledge".

"Attitude" was defined as the intention of participants towards voluntary blood donation practice. Those who answer 50% and above was labeled as having favorable attitude and those who answer less than median was labeled as having unfavorable attitude from total questions intended to measure attitude.

Practice: Denotes when individuals experienced blood donation activity at least once in their life time. Whether a particular participant has experienced blood donation or not, the possible reasons and frequency of blood donation and possible reason for no donation.

Regarding the independent variables

Altruism: In this case study participants who donate or will donate blood to benefit another's without anticipation of rewards from external sources.

Social responsibility: in this context, the participants have an obligation/duty to act/donate blood as their responsibility for benefit of others. Others includes motivational factors like family response, spiritual blessing, access to information like mass media, school training, posters.

Data management and statistical analysis

To facilitate detection of data entry error, the collected data was entered, cleaned, and coded with EPI info version 7. Data were then exported to SPSS version 20.0 for further processing. All required variables recoding and transformation were done before the final data analysis. Frequency distributions, cross-tabulations and graphs were used to describe the variables under the study. After assessing normality of distribution of data, association between outcome variables and several predictor variables including socio-demographic variables, mass media exposure and motivational factors were first analyzed in bivariate logistic regression with each independent variable separately. Predictor variables with p-values up to 0.25 in bivariate analysis and those variables considered important based on literatures [23,24] were retained for final multivariate logistic regression. Before conducting the multivariate logistic regression analysis, preliminary analyses were conducted to

ensure no violation of the assumptions of sample size, multicollinearity and outliers. All correlations among the independent variables were weak to moderate. In multivariate analysis, p -value <0.05 was considered as a cut-off point for a variable to be considered as an independent predictor of the outcome variable. Association between outcome and predictor variables were calculated using odds ratio and 95% confidence interval. Observed differences between samples were considered statistically significant where $p < 0.05$. Finally, result was presented in texts, graphs and tables.

Ethical considerations

The study was approved by the Ethical review board (ERB) of College of Health Science, Addis-Ababa University. The participants enrolled in the study were informed about the study objectives, expected outcomes, benefits and the risks associated with it. A signed written consent was taken from the participants before the interview.

Results

Sociodemographic characteristics

The proposed sample size for this study was 351. Of this 339 students participated in the study making response rate of 96.6%. The study population comprised of 67% males and 33% females. Average age of study participant was 21.29 year (\pm standard deviation=1.66years). Orthodox Christians comprised of 52.8%, Muslim 23% and Protestant 20.9%. By year of study 28.6% were in their 1st year, 23% were in their 2nd year, 24.5% 3rd year and 23.9% were in their 4th year. Details of the background characteristics of the study participants are given in **Table 1**.

Table 1 Distribution of socio-demographic characteristics of students in Samara University College of Health Science, March 2016 (n=339).

Variables		Frequency (%)
Sex	Male	227(67%)
	Female	112(33%)
Age, in years (mean \pm SD)		21.29 \pm 1.66
Religion	Orthodox	179(52.8%)
	Muslim	78(23%)
	Protestant	71(20.9%)
	Other*	11(3.3%)
Ethnicity	Amhara	145(42.8%)

Table 2 Level of knowledge on voluntary blood donation among regular health science students in Samara University, March 2016 (n=339).

Question	Response variables	Frequency (%)
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	Oromo	97(28.6%)
	Tigray	27(8%)
	Gurage	17(5.3%)
	Somali	11(3.2%)
	Wolayita	8(2.4%)
	Afar	7(2.1%)
	Sidama	6(1.8%)
	Silte	4(1.2%)
	Others**	15(4.8%)
Residence	Urban	196(57.8%)
	Rural	143(42.2%)
Department	Nurse	126(37.2%)
	Midwifery	95(28%)
	Health officer	118(34.8%)
Year of study	I	97(28.6%)
	II	78(23%)
	III	83(24.5%)
	IV	81(23.9%)
* =Catholic, Jhobawitness, Adventist wake feta; **=Hadiya, Burji, Kembata		

Level of knowledge towards voluntary blood donation

Among the study participants 319(94.1%) had information about blood donation, 305(90%) of the respondents had knowledge of source of blood for donation, 79.6% and 44.2% of the respondents did not know the age and weight limit required for blood donation respectively. Slightly greater than half (50.2%) of the participants were not aware whether hepatitis C virus (HCV) could be potentially transmitted through blood transfusions although 96% and 67.1% of the respondents are quite aware that HIV and HBV could be transmitted through blood transfusion respectively. Detailed information is described in **Table 2**.

The overall level of knowledge was determined by summing up the correct answers of each individual response together. Hence it is found that 54% (95% confidence interval [CI]: 49.0%-59.0%) of the respondents have scored more than or equal to 50th percentile of the correct answers in which they are labeled as having adequate knowledge. However, the remaining 46% did not achieve the 50th percentile of correct answer.

Do you know about blood group	Participant they know	328 (96.8%)
How many types you know(n=328)	Participant they know	316(96.3%)
Information about blood donation	Participants they have	319(94.1%)
Yes, where do you get(n=319)	Mass media	240(75.2%)
	Family/friend	128(40%)
	Blood donors	106(33.2%)
	School	80(25.1%)
Is human blood manufactured artificially	No (correct response)	272(80.2%)
Knowledge of source of blood for donation	Participants correct response	305(90%)
Source of blood for donation(n=305)	Voluntary donors	289(94.8%)
	Family donors	189(62%)
	Paid donors	84(27.5%)
Knowledge of voluntary blood donation	Participant they know	236(69.6%)
Regular VD have medical benefit		261(77%)
Age limit		69(20.4%)
Weight limit		189(55.8%)
Hemoglobin level to donate		127(37.5%)
Amount of blood donated each time		185(54.6%)
Time interval between two donations		224(66.1%)
Time taken of actual donation process of a pint of whole blood unit		92(27.1%)
Time taken for volume of blood replaced after single donation		138(40.7%)
Duration of donated red blood cells at 2-4°C		144(33.6%)
Knowledge of components separated from unit of donated blood		252(74.3%)
Can person have infected by receiving blood	Yes (correct response)	325(95.9%)
Diseases that can be transmitted during blood transfusion (n=325)	HIV	312(96%)
	HBV	218(67.1%)
	HCV	162(49.8%)
	Syphilis	159(48.9%)
	Malaria	167(51.4%)
	CMV	130(40%)
	Other***	3(0.3%)
Investigation made before transfusion		301(88.8%)
Group not eligible for blood donation (only correct response is registered in the table)	Can one donate with fever	283(83.5%)
	Person with high BP donate	248(73.2%)
	With low BP	292(86.1%)
	Person who taking drug for chronic disease	298(87.9%)
	Person with allergy	265(78.2%)
	Smoker can donate	238(70.2%)
	Person with chronic alcoholism	266(78.5%)

	Person with more than one sexual partner	187(55.2%)
	Person with HIV and hepatitis positive	316(93.2%)
Overall level of knowledge		183(54.0%)
***= Ebola		

Factors associated with level of knowledge

Bivariate and multivariate analysis was computed to determine factors that were associated with level of knowledge of study participants. Bivariate analysis showed that there was statistically significant association of level of knowledge of voluntary blood donation with year of study and department. On crude logistic regression analysis, being department of midwifery had adequate level of knowledge about voluntary blood donation [COR (95% CI): 1.73(1.097, 3.016)]. After controlling for the effects of potentially confounding variables in multivariate logistic regression being midwifery department were remained statistically significant predictor of level of knowledge of VBD

AOR(95%CI)1.95(1.02,3.7). Increased year of study and exposure to mass media for information access increased the odds of level of knowledge of respondents on VBD. On crude analysis, those who are not exposed to mass media for information access about blood donation were less likely knowledgeable than the exposed individuals [COR(95%CI) 0.395(0.243,0.640)]. This association was remained significant after adjustment for confoundings [AOR (95 %CI); 0.404(0.230, 0.711)] Similarly, on crude analysis, being first year [COR(95%CI);0.074((0.035,0.157)], second year [COR(95%CI); 0.097(0.045,0.210)] and third year [COR(95%CI); 0.381(0.177,0.822)] were less likely knowledgeable than being fourth year. These association was significant and the same after multivariate analysis (**Table 3**).

Table 3 Factors associated with knowledge level of Samara University College of regular health science students to wards voluntary blood donation, March 2016 (n=339).

Characteristics	Overall knowledge				
	Inadequate knowledge (%)	Adequate knowledge (%)	COR(95%CI)	AOR(95%CI)	p-value
Sex					
Male	99(43.4)	129(56.6)	1.375(0.873,2.168)	1.21(0.701, 2.1)	
Female	57(51.4)	54(48.6)	1	1	
Age					
15-19	30(62.5)	18(37.5)	0.343(0.088,1.336)	1.8(0.322,10.074)	
20-24	122(43.6)	158(56.4)	0.740(0.212,2.586)	1.47(0.310,6.957)	
≥25	4(36.4)	7(63.6)	1	1	
Department					
Nurse	64(50.8)	62(49.2)	0.936(0.567,1.55)	0.90(0.496,1.64)	
Mid	34(35.8)	61(64.2)	1.73(1.097,3.016)	1.95(1.02,3.7)	0.043
HO	58(49.2)	60(50.8)	1	1	
Year of study					
I	68(70)	29(30)	0.074(0.035,0.157)	0.06(0.026,0.137)	0
II	50(64)	28(36)	0.097(0.045,0.210)	0.094(0.041,0.214)	0
III	26(31.3)	57(68.7)	0.381(0.177,0.822)	0.36(0.161,0.801)	0.012
IV	12(14.8)	69(85.2)	1	1	
Mass media exposure					
No	61(62)	37(38)	0.395(0.243,0.640)	0.404(0.230,0.71)	0.002
Yes	95(39)	146(61)	1	1	

Attitude towards voluntary blood donation

Among overall respondents 93.5% said blood donation is good habit, whereas 6.5% thinks badly. Furthermore 82.9% of the respondents replied that they are willing to donate blood voluntarily in the future. Similarly, 92.3% of individuals responded as VBD is the best source of blood donation (**Table 4**). Concerning over all attitude of the study it was observed that 65.8% of respondents (95% confidence interval [CI]: 61.0%-71.0%) had favorable attitude towards VBD. The remaining segment had unfavorable attitude towards VBD.

Table 4 Attitude towards voluntary blood donation among Samara University regular health science students, March 2016 (n=339).

Variable	Frequency (%)
Do you think that donating blood is good habit	317(93.5%)
Do you think there is a need to give incentives to those who donate blood	108(31.9%)
Do you think that voluntary blood donation is best source to make safe blood	313(92.3%)
Could harm occur to a blood donor after donation	193(56.9%)
Should patient relatives be asked to donate blood	246(72.6%)
Do you think donating blood lower donor's immunity	237(69.9%)
Does donation makes weak	230(67.8%)
Could donation leads to anemia	225(66.4%)

Are you willing to donate in the future	281(82.9%)
Do you encourage relatives to donate	279(82.3%)
Over all attitude	65.80%

Factors associated with attitude towards voluntary blood donation

Using bivariate and multivariate logistic regression, we identified different variables that were associated with level of attitude of study participants. In bivariate analysis, there was significant association of level of attitude of VBD with department. On crude logistic regression analysis, a significantly higher proportion of study participants in department of midwifery had favorable attitude towards VBD compared to participants in nursing department [COR (95% CI): 2.192(1.238, 3.882)]. This association was remained significant after adjustment logistic regression [AOR (95%CI) 0.943(1.066, 3.542)]. Social duty showed significant association in crude analysis, those who had no interest for maintaining one's health and accompanying others had lesser likelihood of having favorable attitude than socially responsible [COR (95%CI): 0.47(0.296, 0.746)]. This association was remained significant after adjustment multivariate regression [AOR (95 %CI); 0.556(0.341, 0.906)]. This study also showed that, respondents who had inadequate knowledge 0.45 times [AOR, (95% CI), 0.45(0.258, 0.790)] less likely to had favorable attitude towards VBD as compared to adequate knowledge (**Table 5**).

Table 5 Factors associated with attitude level of Samara University College of health science students on voluntary blood donation, March 2016 (n=339).

Variables	Overall Attitude				
	Unfavorable (%)	Favorable (%)	COR(95%CI)	AOR(95%CI)	p-value
Department					
Nurse	57(45.2)	69(54.8)	1	1	
Midwifery	26(27.4)	69(72.6)	2.192(1.238, 3.882)	1.85(1.004,3.40)	0.048
Health officer	33(28)	85(72)	2.128(1.248,3.628)	2.14(1.22, 3.744)	0.008
Year of study					
I	33(34)	64(66)	0.723(0.379,1.378)	1.06(0.504,2.236)	
II	34(43.6)	44(56.4)	0.483(0.249,0.937)	0.80(0.374,1.701)	
III	27(32.5)	56(67.5)	0.773(0.395,1.513)	0.86(0.420,1.768)	
IV	22(27.2)	59(72.8)	1	1	
Mass media exposure					
No	42(42.9)	56(57.1)	0.591(0.364, 0.959)	0.88(0.518,1.501)	

Yes	74(30.7)	167(69.3)	1	1	
Social duty					
No	56(45.2)	68(54.8)	0.47(0.296,0.746)	0.58(0.350,0.943)	0.028
Yes	60(28)	155(72)	1	1	
Spiritual bless					
No	75(40.1)	112(59.9)	0.552(0.347,0.876)	0.85(0.508, 1.43)	
Yes	41(27)	111(73)	1	1	
Level of knowledge					
Not know ledged	71(45.5)	85(54.5)	0.39(0.246,0.619)	0.45(0.258,0.79)	0.005
know ledged	45(24.6)	138(75.4)	1	1	

Practice towards voluntary blood donation

As far as blood donation practice is concerned, only less than one quarter, 83 (24.5%) (95% confidence interval [CI]: 20.0%-29.0%) have ever donated blood and the remaining 256 (75.5%) never exercised any blood donation practice so far. More than fifty-seven (57.8) percent of donors had donated blood once in their life time. Moreover, only 16 (19.3%) reported to have had donated blood regularly based on voluntarism. Concerning reasons for non-donating 69.6% of respondents said that it is due to medical reasons, lack of information (62.2%), Fear of weakness (56.9%) were mentioned as major reasons (Table 6).

Table 6 Practice of voluntary blood donation among Samara University College of health, regular health science students on voluntary blood donation, March 2016 (n=339).

Variables	Frequency	%
Have you ever donated blood? (n=339)		
Yes	83	24.5
No	256	75.5
If yes, how many times in a year(n=83)		
Once	48	57.8
Twice	16	19.3
Three times	13	15.7
Four times	6	7.2
Last time you have donated blood		
Before one year	55	66.3
Within the year	28	33.7
Are you regular donor(n=83)		
Yes	16	19.3
No	67	80.7
How do you feel after donating? (n=83)		
Comfortable	40	48.2

Fear	27	32.5
Anger	4	4.8
Indifferent	12	14.5
Reasons for donating blood		
Altruism	217	64
Sense of social responsibility	215	63.4
Helping friends/family	226	66.7
Spiritual bless	152	44.8
Others	9	2.7
Reasons for non-donating blood		
Medical reason	236	69.6
Lack of time to donate	51	15
Lack of information	211	62.2
Parental restriction	108	31.9
Fear of weakness from donation	193	56.9
Others	8	2.4

Factors affecting practice of voluntary blood donation

A multivariate analysis on blood donation practice revealed a statistical significant association with department. Nurses were 1.881 times more likely to practice VBD than health officers [AOR (95% CI): 1.881(1.002, 3.532)]. From religion towards VBD, being Muslim were found to be less likely to practice than Orthodox [AOR (95%CI): 0.391(0.181, 0.844)] (Table 7).

Table 7 Factors associated with practice of voluntary blood donation among Samara University College of regular health science students, March, 2016 (n=339).

Variables	Blood donation status				
	No n (%)	Yes n (%)	COR(95%CI)	AOR(95%CI)	P-value

Age					
15-19	40(83.3)	8(16.7)	0.35(0.83,1.43)	0.31(0.061,1.587)	
20-24	209(74.6)	71(25.4)	0.594 (0.169,2.091)	0.459 (0.114,1.842)	
≥25	7(63.6)	4(26.4)	1	1	
Religion					
Orthodox	133(74.3)	46(25.7)	1	1	
Muslim	67(85.9)	11(11.1)	0.475(0.231,0.976)	0.391 (0.181,0.844)	0.017
Protestant	49(69)	22(31)	1.298 (0.709,2.376)	1.499(0.788,2.85)	
Other****	7(63.6)	4(26.4)	1.652 (0.462,5.903)	1.693 (0.441,6.494)	
Department					
Nurse	88(69.8)	38(30.2)	1.784 (0.958,3.229)	1.881(1.002,3.532)	0.049
Midwifery	73(76.8)	22(23.2)	1.245 (0.644,2.407)	1.377(0.689,2.755)	
Health officer	95(80.5)	23(19.5)	1	1	
Year of study					
I	80(82.5)	17(17.5)	0.505 (0.249,1.025)	0.536 (0.246,1.166)	
II	56(71.8)	22(28.2)	0.933(0.47,1.853)	0.877(0.405,1.897)	
III	63(76)	20(24)	0.754 (0.377,1.508)	0.842(0.406,1.746)	
IV	57(70.4)	24(29.6)	1	1	
Social duty					
No	88(71)	36(29)	1.462 (0.883,2.423)	1.33(0.767,2.306)	
yes	168(78.31)	47(21.9)	1	1	
Altruism					
No	82(67.2)	40(32.8)	1.974 (1.192,3.268)	2.038(1.175,3.533)	0.011
Yes	174(80.2)	43(19.8)	1	1	

Discussion

Globally, there is a shortage of blood supply due to high blood demand and increase in medical treatment procedures requiring blood transfusion therapy particularly in developing countries. Maintaining an adequate and safe blood supply is an issue of concern to health planners especially with increase in demand. Therefore, understanding level of knowledge, attitude, practice, and associated factor towards voluntary blood donation (VBD) is essential. In this study, an effort was made to find out the level of Knowledge, Attitude and Practice

(KAP) and their respective associated factors towards VBD. The overall knowledge level of the study was about 54% which is less than a study conducted in India who answered correctly in medical students were 60.81% and 77.52% and 79.21% of residents and faculty respectively [25]. It also lesser than the results of a previous similar study conducted in Addis Ababa University (83%) [17]. This result implies that knowledge of study participants on VBD may be inadequate and this is probably because of the difference that student in Samara University might not involve in blood donation club than in Addis Ababa and medicine students are more involved. The prevalence of adequate knowledge towards blood donation is estimated to be 60% in developing, which is comparable with the current study result [13]. Level of knowledge in this study was higher in relative to study done in Nepal students with average score of 32.01%, and Ambo University student (40.4%). This might be the difference of study participants where all respondents in Nepal and Ambo includes all the students of other faculty while this study considers only undergraduate health science students [8,16] about 95.9% of the students said that diseases can be transmitted by blood transfusion whereas 68.93% of students in Nepal said that disease can be transmitted by blood transfusion and HIV-AIDS and hepatitis were the most frequently mentioned diseases, which was similar to Nepal students [16].

In the present study, it was observed that mass media exposure to source for information were found to be significantly associated with level of knowledge of voluntary blood donation as compared to previous study family education was not associated. This may be due to the fact that national blood bank provides health education on blood donation in their setting. Year of study and department were also significant predictor of level of knowledge. This is in line with other studies done in Ethiopia Universities [8,17].

In this survey 65.8% of respondents had favorable attitude towards voluntary blood donation which is almost equivalent to a study conducted in AAU where 68% of respondents turned out to have a positive attitude towards VBD [17]. Level of attitude in this study was lower than studies done in India with level of attitude 85% [26]. This might be explained that timely training, and repeated exposure to blood transfusion procedures (availability of blood transfusion service in health institution increases the day to day exposure of individuals with the routine activities dealt with blood transfusions procedures) which in turn lead to acquire a better knowledge of blood transfusion process and so positive attitude. In the current, level of attitude was more than reported in studies from student's in Pakistan (42%) and among Ambo University students with a study conducted in which only about 47.4% of the respondents had favorable attitude towards blood donation [8,20]. This difference may be due to study population difference; on previous study participants were selected from all faculties of natural and social studies while the current study was only on health science students. Of the total participant, 82.9% of them were willing to donate blood voluntarily in the future which was less than the study in AAU medical and health science students [17]. In this study 92.3% of respondents accepted that voluntary donor is the best

source of blood donation. Previous study in AAU health science students, 76.6%, 34.6% and 59.1% of respondents believed that blood donation makes weak, cause anemia and reduce immunity respectively [17] whereas in this study 67.8%, 66.4% and 69.9% respectively. Knowledge of blood donation is a prerequisite tool for avoiding fear misconception, and building positive attitude towards VBD. Controlling for other variables, level of knowledge of blood donation emerged as a statistically significant predictor of attitude of the study participants towards VBD in that, those who had inadequate knowledge was less likely had favorable attitudes than the counterpart [AOR(95%CI) 0.45(0.258,0.79)]. A statistical significant association was also observed between department, mass media, and social duty with level of attitude. This was also supported by a study conducted in AAU [17].

In this study, it was found that 24.5% of individuals have ever donated blood in their life time. This was lower than compared with the study done in south India health science students where donation status was 38% and in Saudi Arabia (34.16%) [26,27]. This could be because of school training, availability of blood transfusion service in an institution, and establishment of a well-organized blood donation club.

Significant number of the current study participant had inadequate level of knowledge towards VBD. On the other hand, it was comparable to the study done in Addis Ababa university student which was 23.4% [17]. Blood donation status of this study was comparable with study result in developing countries such as Nigeria and in Asian which supports, blood donation rates are considerably less in developing countries [28]. Similar to other studies, significant numbers of participants in this study didn't ever donated blood which accounts 75.5% due to different reasons. Among those who didn't ever donated blood 236(69.6%) of the respondents said that it is due to medical reasons, lack of information by 62.2%, Fear of weakness from donation by 56.9% were mentioned as reasons for not donating a blood. This was comparable with other studies [29]. Majority of blood donors in this study (66.7%) were motivated to donate blood in helping families/friends. Others were motivated by social responsibility (interest for maintaining one's health and accompanying others. Different studies also revealed that people donate blood for altruism (humanity) purpose and to help families/friends [8,17,30]. In this study, religion, department and altruism were associated with level of blood donation practice, but factors like sex, age, residence, mass media exposure, and increases level of knowledge, which were predictors of blood donation in other studies [8,17] were not found to be associated in this study. This might be due to Small sample size of the study participant.

Conclusion

The level of knowledge towards blood donation was 54%, which was not as high as would expected considering the fact that the study participants are health science students in which they are expected to be more informed than anyone else.

Department and mass media exposure were associated with level of knowledge. Besides this, significant number (34.5%) of students in this study also have unfavorable attitude towards voluntary blood donation, and factors associated with attitude of study respondents were level of knowledge, department, mass media exposure, and social responsibility. Proportion of blood donation practice the current study was very low which was 24.5%; particularly, level of regular VBD (19.3%) was very low. Religion, department and feeling humanity were among factors associated with donation practice.

Finally, this study revealed that knowledge, attitude and practice of health science students toward VBD was affected by different socio-demographic characteristics of the study participants, their department, their level of knowledge, being socially responsible, altruistic behavior exposure to mass media and other factors. These factors should be considered during Voluntary blood donation program development.

Based on the findings educational Institutions across the country are home for potential safe blood donors in the form of young and healthy students to meet the blood requirements of the country. Role of healthcare institutions and its student's in VBD should lead from the front to donate blood voluntarily and take all necessary steps to create more awareness program on blood donations among entire student community. For this it is better to incorporate blood donation topic in to the existing curriculum and mass media, collaborative work with different national and international institution are important.

Declarations

Ethics approval and consent to participate

The study was approved by the Ethical review board (ERB) of College of Health Science, Addis-Ababa University. The participants enrolled in the study were informed about the study objectives, expected outcomes, benefits and the risks associated with it. A signed written consent was taken from the participants before the interview.

Availability of data and materials

The findings were declared from available data source. All possible required information are attached and included in the manuscript. Moreover, raw data is available in the hand of the corresponding author. All coauthors gave full responsibility for corresponding author to share or discuss with editors and reviewers in review process.

Competing interests

The authors have no conflict of interests to declare.

Authors' contributions

All authors contributed to the design of the study and the interpretation of data. WT performed the data analysis and drafted the manuscript. EY and MLL assisted in the data analysis and critically revised the manuscript. All authors had read and approved the final manuscript.

Acknowledgement

The authors would like to acknowledge Addis Ababa University and Samara University for providing cooperative funding for the study, the study participants and data collectors.

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