




Assessment of Blood Donation Practice and Its Associated Factors Among Wollega University Undergraduate Students, Ethiopia

Adisu Tafari Shama , Gemechis Teka, Samuel Yohannes Lemu, Biftu Tesfaye, Hawi Ebisa, Dejene Seyoum Gebre , Dufera Rikitu Terefa 

Wollega University, Institute of Health Sciences, Department of Public Health, Nekemte, Ethiopia

Correspondence: Adisu Tafari Shama, Wollega University, Institute of Health Sciences, Department of Public Health, PO. Box: 395, Nekemte, Ethiopia, Fax +251 576617980, Email adisuteferi1906@gmail.com

Introduction: Blood donation is the process of collecting blood from donors who are at low risk for infection and unlikely to jeopardize their own health. Blood donation addresses maternal and child mortality and contributes to saving millions of lives. But many African countries including Ethiopia are far below the minimum blood collection rate. Furthermore, the blood donation practice is not well studied among young university students in the study area. Hence, this study was done to assess the blood donation practice and associated factors among Wollega University students, Ethiopia.

Methods: A cross-sectional study was conducted among 387 students of Wollega University. The students were selected by systematic random sampling. Self-administered questionnaire was used to collect the data. The data were entered into Epidata V.3.1 and exported to SPSSV.25 for analysis. Both bivariate and multivariate logistic regressions were used to identify the associated factors. Adjusted odds ratio with 95% confidence interval and P-value <0.05 were used to declare the statistically significant associations in the multivariable regression. The analyzed result was presented using tables, graphs, and text.

Results: Of the 360 respondents, 147 (40.8%; 95% CI: 35.7–46.1%) ever donated blood. Blood donation practice was significantly associated with college of the students (AOR = 3.247; 95% CI: 1.348–7.820), not taking part in blood donation campaigns (AOR = 0.285; 95% CI: 0.161–0.503), knowledge of blood bank location (AOR = 5.297; 95% CI: 3.081–9.110), knowledge about blood donation (AOR = 2.035; 95% CI: 1.123–3.686) and attitude toward blood donation (AOR = 2.266; 95% CI: 1.122–4.577).

Conclusion: The magnitude of blood donation in this study was found to be less than the recommended level by the World Health Organization. Absence of the blood donation campaigns, college of study, lack of knowledge, and poor attitude toward blood donation were the factors that influence the blood donation practice. All health and related institutions including the Wollega University must work in coordination to improve the blood donation practice focusing on the regular voluntary blood donors.

Keywords: blood, blood donation, voluntary blood donation, practice, associated factors, students, Ethiopia

Introduction

Blood is one of the vital body fluids containing special components that deliver essential substances like oxygen and nutrients to the body's cells and is used to remove unwanted metabolic wastes from the cells.¹ It consists primarily of plasma and blood cells (white blood cells, red blood cells, and platelets), and blood donation is the only source of blood.^{2,3}

Blood donation is the process of collecting blood from donors who are at low risk for infection and unlikely to jeopardize their health by blood donation.⁴ It is a lifesaving practice for people who lost ample volumes of blood as a result of accidents, obstetric and gynecological bleedings, severe anemia, and cancers.⁵ There are three main types of blood donors: voluntary non-remunerated, replacement, and paid donors. Voluntary non-remunerated donation is giving one's own blood, plasma or other blood components by free will and without receiving any form of payment either in cash or in-kind. Family/replacement blood donation is giving the blood when it is required by a member of the patient's family or community. Paid donation is another

category of blood donation by which a person donates blood in exchange of money or other form of payment. This last category of blood donation is also known as professional blood donation.⁶ Among the categories, voluntary non-remunerated blood donation or voluntary blood donation in short is the safest form of blood donation because the transfusion-transmitted infection is lowest among these donors.⁷ In Ethiopia, a replacement donor system was applied before 2011, while voluntary blood collection system is used since 2011.⁸

The World Health Organization (WHO) recommends 10 donations per 1000 populations to satisfy the blood needs of a given country.⁷ Despite the World Health Organization's suggestion for countries to focus on young people to achieve 100% non-remunerated voluntary blood donation,⁹ there is insufficiency in blood donation to meet the demand in different corners of the world.¹⁰ Globally, over 80 million units of blood are donated each year; however, only two million units are donated in low-income countries where the need is very high.¹¹ In sub-Saharan Africa (SSA), where over 12% of world's populations live,¹² only 38% was collected out of the yearly 18 million estimated units of safe blood need.³ In Ethiopia, adequate and safe blood supply has remained a challenge where there has been great inadequacy and inequity in access to blood. The national blood requirement in Ethiopia is 18,000 units per day, while only 1100 units are being collected.¹³

The previously conducted studies in different parts showed that the magnitude of blood donation practice range from 10% to 35.69% in Asia^{14–16} and 10.64% to 61.69% in Africa^{11,17,18} which was relatively incomparable with high-income countries. It was found to be 29% in Saudi Arabia,¹⁹ 26.7% in India,²⁰ 27.1% in Ghana,²¹ 15.3% in Nigeria²² and 22.6%–47.8%,^{5,23–28} in different regions of Ethiopia. On top of this, various factors are identified as the factors that hinder blood donation practice. These factors are a perception of being unfit to donate blood, fear of anemia, fear of health risks, and lack of information about blood donation.²⁹ Furthermore, age, gender, religion, knowledge, attitude, educational status, self-perceived health status, and family education are also factors that can affect the blood donation practice.^{5,19,21,23,24,26,28}

Insufficient blood donation and shortage of blood contribute to preventable deaths, which result from major surgery, trauma, cancer, anemia, and pregnancy-related complications.^{30,31} In developing countries, about half a million mothers die each year during pregnancy and childbirth with hemorrhage.³² Children are particularly vulnerable to a shortage of blood in the malarious area because of severe anemia.³³

The youngsters in University contribute in life-saving not only through blood donation, but also they can serve as long-term donors, less risky blood donors, role models, and motivators to increase the number of donors as they pursue their career.³⁴ The students provide the safest blood, and the country's blood supply can be improved by recruiting and retaining the student donors.²⁸ However, the practice of blood donation among these populations was not well studied. Therefore, this study was aimed to assess the magnitude and factors associated with blood donation practice among Wollega University students in western Ethiopia.

Materials and Methods

Study Area

The study was conducted from Dec 13, 2021 to Dec 28, 2021 at Wollega University Nekemte Campus, which is located 331km from Addis Ababa. The University runs 60 undergraduate and 17 graduate programs on three different campuses in Nekemte, Gimbi, and Shambu towns. Four thousand forty-eight (4048) students were attending undergraduate programs in all departments.⁶

Study Design and Period

An institutional-based cross-sectional study design was employed.

Source and Study Population

All undergraduate students who were attending their class at Wollega University, Nekemte campus were the source population. All regular students who were from the three randomly selected colleges of Wollega University were the study population.

Inclusion and Exclusion Criteria

Inclusion Criteria

All regular students found in Wollega University, Nekemte campus.

Exclusion Criteria

Students who were not present in the compound during the data collection period were excluded.

Sample Size Determination

The sample size for the study was calculated using a single population proportion formula

$n = (Z\alpha/2)^2 \frac{p(1-p)}{d^2}$ where n = the calculated sample size, z = level of significance, p = blood donation proportion, d = margin of error. The assumptions like 95% confidence interval, 5% margin of error, $\alpha = 0.05$, and 10% non-response rate were considered. The proportion (p) of blood donation used to calculate the sample size for this study was taken from the study conducted among college students in Mizan-Aman, Southwest Ethiopia, and it was 35.5%.²⁴ Accordingly, the sample size was calculated as

$$n = \frac{(1.96)(1.96)(0.355)(0.645)}{(0.05)(0.05)} \approx 352$$

By adding 10% for non-response rate, the final sample size of the study was 387.

Sampling Technique

Initially, one-third of the colleges/institutes were considered from the total nine colleges/institutes in the Wollega University, Nekemte campus. Accordingly, three colleges/institutes (College of Business and Economics, Institute of Health Sciences, and Institute of Language Studies and Journalism) were selected randomly by lottery method. The calculated sample size was proportionally allocated to colleges based on their size. List of the students was taken from the colleges to prepare the sampling frame, while the systematic random sampling technique was used to select the final study participants. The sampling interval ($K = 4$) for the systematic random sampling was calculated using the formula, $K = \frac{N}{n}$, where N is the total number of students in the selected college/institute, and n is the calculated sample size. The first participant was selected by lottery method and continued every 4th student in each selected institute/college until the allocated sample size was achieved (Figure 1).

Data Collection Tool, Techniques and Data Collectors

The data were collected by using a self-administered questionnaire, which was adapted from different literatures based on the objectives of the study.^{28,35,36} Socio-demographic factors, knowledge, attitude, and practice-related questions were the components of the questionnaire. It was developed and distributed in English language (see [Supplementary File 1](#)). Five master of public health students collected the data, while 2 master of public health holder lecturers supervised the data collection procedures. Two days of training were given for both data collectors and supervisors on the data collection tools and procedures, objectives of the study, ethical issues and data collection period.

Study Variables

Dependent Variable

The practice of blood donation.

Independent Variables

Socio-demographic and economic factors, knowledge of blood donation, attitude toward blood donation, and other behavioral factors (smoking, alcohol consumption, khat chewing, and social media usage).

Operational Definitions

Attitude towards blood donation was assessed by using twelve questions and those students who scored more than the mean value were considered as having a favorable attitude and vice versa.

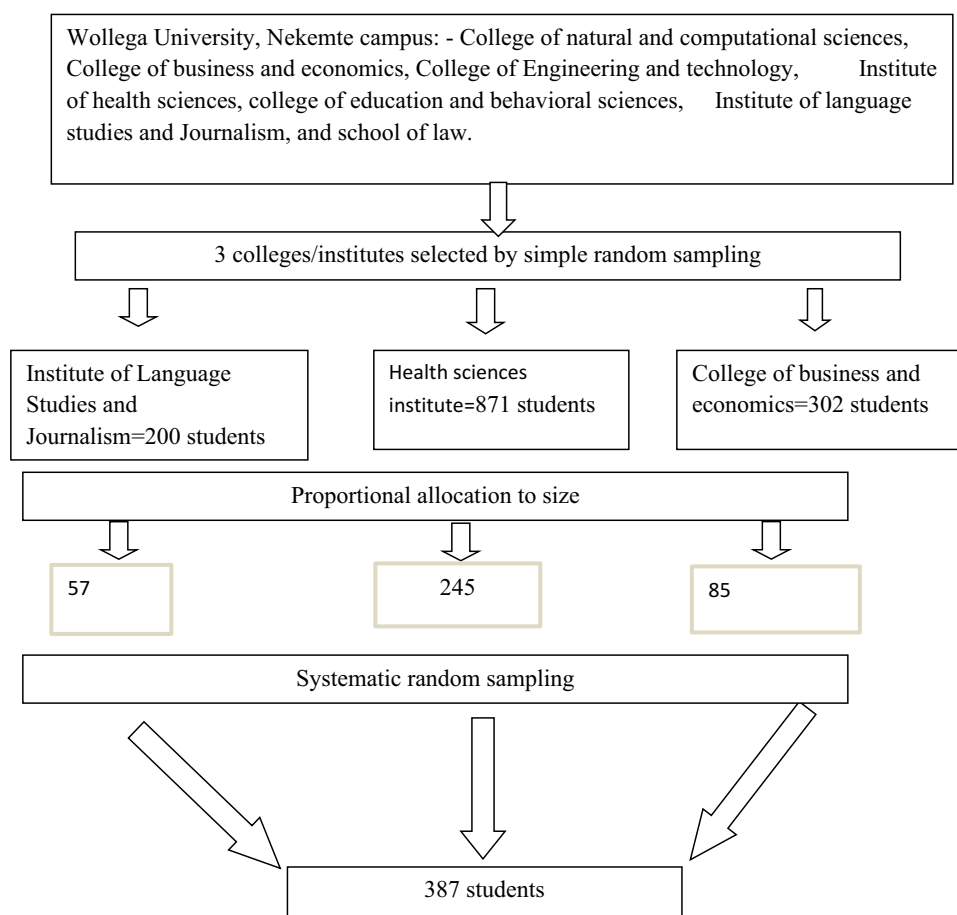


Figure 1 Sampling techniques for the study of blood donation practice and associated factors among Wollega University undergraduate regular students, 2021.

Knowledge of blood donation was assessed by using fourteen knowledge-related questions, whereas the mean value was considered to classify the students as having good knowledge or poor knowledge.

Remunerated/paid donors: Those individuals who give blood in favor of money or other payment.

Practice of Blood Donation

Those students who donated blood (voluntarily, replacement, and paid) at least once in a lifetime were categorized as “ever donated” whereas who never donated blood at all in a lifetime were categorized as “never donated”.³⁷

Data Quality Control

The data collection tool was pretested on 5% (19) of the sample size on students in Gimbi campus which was out of the study setting. Besides, two-day training was given to data collectors and supervisors. During the data collection period, the supervisors supervised the data collectors frequently and the collected data was checked for consistency and completeness on a daily basis. In case the quality problem raised, it was brought for discussion and necessary corrections were made through returning the questionnaire for respective data collector. After data collection, the collected data were entered into Epi-data software version 3.1. (the EpiData Association, Odense Denmark) twice by different individuals and checked for consistency.

Data Processing and Analysis

The data were entered into epi-data version 3.1. (the EpiData Association, Odense Denmark) and then exported into SPSS version 25 (IBM, Armonk, New York, US) for data coding and further analysis. The data were summarized using percentages, mean, and presented by texts, figures and frequency tables. The dependent variable (blood donation

practice) was recoded as practiced or not practiced. The bivariable binary logistic regression analysis was run and the variables that showed association at p -value <0.25 were considered as candidates for multivariable logistic regression. The multicollinearity was checked, and none of the independent variables had the collinearity problem at variance inflation factor >10 . The multivariable logistic regression was done. Adjusted odds ratio with their respective 95% confidence interval was used to express the magnitude of association and p -value <0.05 to declare the statistically significant association. Model fitness was checked using Hosmer and Lemeshow's test with a p -value of 0.283. Being above 0.05, the value indicated that the model fitted the data.

Results

Socio-Demographic Characteristics of the Students

Out of 387, 360 students participated with a response rate of 93.02%. The respondents' mean age was $(22.45 \pm 2.096SD)$ years old and it ranges from 18 to 30 years. The majority of the participants were males (227 (63.1%)). Regarding religion, 194 (53.9%), 102 (28.3%) and 49 (13.6%) of the respondents were Protestant, Orthodox and Muslim, respectively. About 263 (73.1%) and 219 (60.8%) of the study participants reported that their fathers and mothers ever attended education, respectively. Two-third (239 (66.4%)) of the students get monthly pocket money of less than/equal to 500 Ethiopian birr/ETB (Table 1).

Table 1 Socio-Demographic and Economic Characteristics of Wollega University Regular Undergraduate Students, Ethiopia, 2021 (n = 360)

Characteristics	Category	Frequency (%)
Age	16–20	62(17.2%)
	21–25	269(74.7%)
	26–30	29(8.1%)
Gender	Female	133(36.9%)
	Male	227(63.1%)
Religion	Orthodox	102(28.3%)
	Muslim	49(13.6)
	Protestant	194(53.9%)
	Catholic	5(1.4%)
	Other ^a	10(2.8%)
Ethnicity	Amhara	85(23.6%)
	Oromo	202(56.1%)
	Other ^b	73(20.3%)
Marital status	Single	300(83.3%)
	Married	27(7.5%)
	In relationship	33(9.2%)
Previous area of Residence	Urban	188(52.2%)
	Rural	172(47.8%)
College	College of Business and Economics	76(21.1%)
	Health Science Institute/HIS	239(66.4%)
	Institute of Language Studies and Journalism/ILSJ	45(12.5%)
Academic year	1st year	61(16.9%)
	2nd year	100(27.8%)
	3rd year	155(43.1%)
	4th year	44(12.2%)
Father ever attended school	Yes	263(73.1%)
	No	97(26.9%)

(Continued)

Table 1 (Continued).

Characteristics	Category	Frequency (%)
Father's level of education (n=263)	Primary	78 (21.7%)
	Secondary	64 (17.8%)
	Technical/Vocational	14 (3.9%)
	Higher (College/University)	107 (29.7%)
Mother ever attended school	Yes	219 (60.8%)
	No	141 (39.2%)
Mother's level of education (n=219)	Primary	103 (28.6%)
	Secondary	43 (11.9%)
	Technical/Vocational	12 (3.3%)
	Higher (College/University)	61 (16.9%)
Monthly pocket money in Ethiopia birr	<=500	239(66.4%)
	501–1000	86(23.9%)
	1001–1500	14(3.9%)
	>1501	21(5.8%)

Notes: ^aAdventist, waqefata, Apostles. ^bAfar, Agaw, Nuer, Shimasha, Sidama, Siltea, Somali, South Sudanese, Tigraway, Wolayita, Berta, Dawro, Gamo, Gedio, Gofa, Gurage, Hadiya, Kambata, Konso, Konta.

Behavioral Factors of the Students

One fifth (20.4%) of those students who have a habit of alcohol consumption consume alcohol more than five days per month, while 8 (33.3%) of the students who chew khat chew more than five days/month. Among the cigarette smokers, 8 (80%) of them smoke more than five sticks per event (Figure 2).

Knowledge About Blood Donations and Blood Bank Locations

Overall, 189 (52.5%) of the students had good knowledge about blood donation. On the other hand, 135 (37.5%) of the students have knowledge of blood bank location in their current or previous area of residence (Table 2).

Regarding the sources of information about blood donation, majority (221 (61.4%)) reported that school/training is their primary source of information, while mass media is reported as primary source of information for 188 (52.2%) of the students (Figure 3).

Attitude Toward Blood Donation

Majority (325 (90.3%)) of the study participants thought that donating blood is a good idea, while about three quarters (274 (76.1%)) are willing to donate if called upon next time. About 210 (58.3%) perceive that blood should be donated

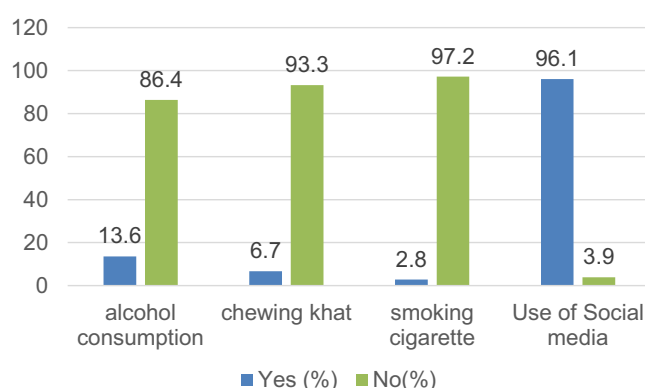


Figure 2 Behavioral characteristics of the students participated in the study of blood donations and associated factors among Wollega University undergraduate regular students, 2021 (n = 360).

Table 2 Level of Blood Donation-Related Knowledge Among Wollega University Students, Ethiopia, 2021 (n = 360)

Characteristics	Category	Frequency (%)
Knowledge/hearing or seeing blood donation	Yes*I	308(85.6%)
	No	52(14.4%)
Minimum age required to donate blood	<18 years	57(15.8%)
	18 years*I	68(18.9%)
	>18	126(35.0%)
	I do not know	109(30.3%)
Maximum age required for donating blood	45–55 years	107 (29.7%)
	56–64 years	26 (7.2%)
	65 years*I	49 (13.6%)
	Do not know	178 (49.4%)
Minimum weight required to donate blood	<45kg	54 (15.0%)
	45kg*I	48 (13.3%)
	>45 kg	135 (37.5%)
	Do not know	123 (34.2%)
Time gap required to donate again	3 months*I	142 (39.4%)
	6 months	36 (10.0%)
	Year	53 (14.7%)
	Do not know	129 (35.8%)
Amount of blood taken from a single person in one event	<500mL*I	131 (36.4%)
	500–1000mL	52 (14.4%)
	Do not know	177 (49.2%)
Time taken to donate for a single voluntary blood donor	<= 20 minutes*I	82 (22.8%)
	20–60 minutes	91 (25.3%)
	I do not know	187 (51.9%)
Site/body part where blood is drawn	Arm*I	256 (71.1%)
	Buttock	9 (2.5%)
	Another site	11 (3.1%)
	Do not know	84 (23.3%)
Know place where blood can be donated	Health facility*I	181(50.3%)
	Blood bank*I	249(69.2%)
	Campaign* I	62(17.2%)
	Do not know	48(13.3%)
Number of persons benefited from a unit of blood	One	72 (20.0%)
	Two	22 (6.1%)
	Three*I	24 (6.7%)
	Four and above	58 (16.1%)
	Do not know	184 (51.1%)
Awareness of Health benefits of donating blood for donor	Yes*I	256 (71.1%)
	No	36 (10.0%)
	Do not know	68 (18.9%)
Awareness of Transmission of Infection by blood transfusion	Yes*I	317 (88.1%)
	No	43 (11.9%)
Knowledge of common blood group types	Yes*I	286 (79.4%)
	No	74(20.6%)
Knowledge of respondents about their blood group type	Yes*I	210(58.3%)
	No	150(41.7%)
Overall knowledge about blood donation	Good	189(52.5%)
	Poor	171(47.5%)
Know blood bank location in current or previous resident	Yes	135(37.5%)
	No	225(62.5%)

Note: *I Correct answer for knowledge related questions.

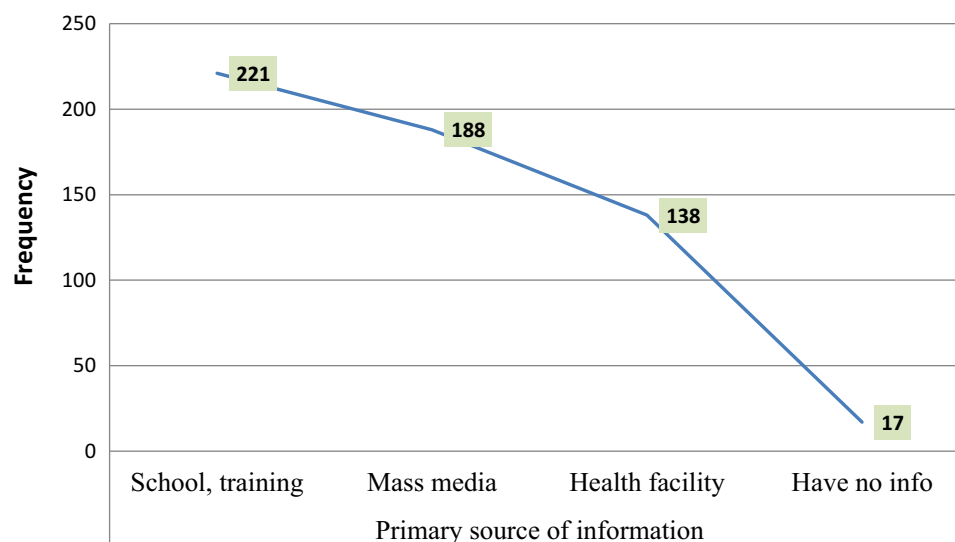


Figure 3 Primary sources of information about blood donation among Wollega University students, Ethiopia, 2021 (n = 360; some students cited more than one source of information).

for anyone in need. About 189 (52.5%) of the students perceive that something harmful could happen to a donor during/after blood donation. Among the total respondents, 284 (78.9%) had a positive attitude towards voluntary blood donation (Table 3).

Practice of Blood Donation

Among the 360 participants, only 147 (40.8%; 95% CI: 35.7–46.1%) have ever donated blood in their lifetime. Voluntary blood donation was found to be 105 (29%), while it was reported to be 71.4% among those donated. Of those who had donated, majority of them 80 (54.4%) have donated once. One third (118 (32.8%)) of the students ever participated in blood donation campaigns. Some of the reasons hindering blood donation were family or relatives never been in need of blood transfusion (12.7%), lack of knowledge/courage (8.6%), and fear of anemia (17.8%) (Table 4).

Table 3 Attitude Towards Blood Donation Among Wollega University Regular Students, Ethiopia, 2021 (n = 360)

Characteristics	Category	Frequency (%)
Thought about blood donation	It is a good idea	325(90.3%)
	It is a bad idea	7(1.9%)
	Have no idea	28(7.8%)
Persons who should receive blood donation	No one	25(6.9%)
	Paid	6(1.7%)
	Relatives	52(14.4%)
	Anyone in need	210(58.3%)
	Do not know	67(18.6%)
Willingness to donate blood next time if get the chance or by their schedule	Yes	274(76.1%)
	No	86(23.9%)
Willingness to encourage others to donate blood	Yes	292(81.1%)
	No	68(18.9%)
Ever encountered a disease or emergency on yourself or a family where by you needed a blood	Yes	123(34.2%)
	No	237(65.8%)
Perception about Something harmful happening to a blood donor during or after blood donation	Yes	189(52.5%)
	No	171(47.5%)
Overall attitude	Favorable	284(78.9%)
	Unfavorable	76(21.1%)

Table 4 Practice of Blood Donation Among Wollega University Regular Students, Ethiopia, 2021 (n = 360)

Variable	Category	Frequency (%)
Time since the recent blood donation (n=147)	Within this year	44(29.9%)
	1–2 years ago	48(32.7%)
	≥3 years ago	55(37.4%)
Place where the recent blood donated (n=147)	In health institution	48(32.7%)
	Blood bank	57(38.8%)
	Event organized in the campus	42(28.5%)
Frequency of blood donation practice (n=147)	Once	80(54.4%)
	2–3 times	42(28.5%)
	More than 3 times	25(17%)
Reason for donating blood (n=147)	A relative/friend	27(18.4%)
	Voluntarily	105(71.4%)
	Remunerated (paid)	8(5.4%)
	To know own status	7(4.7%)
Reason for not donating blood (n=213)	Unfit to donate	28(13%)
	Fear of anemia	38(17.8%)
	Family or relative never been in need of transfusion	27(12.7%)
	Lack of knowledge/courage	31(8.6%)
	Religion forbids	8(3.8%)
	Have no specific reasons	81(38%)
Taking part in blood donation campaigns	Yes	118(32.8%)
	No	242(67.2%)

Factors Associated with Blood Donation Practice

In bivariable binary logistic regression, eleven factors, namely, age, college of the students, year of study, father's educational status, monthly pocket money, khat chewing, cigarette smoking, participating in blood donation campaigns, knowing the location of blood bank in the previous and current residence, knowledge about blood donations and attitude toward blood donation, showed significant associations with blood donation practice. However, only five factors showed significant association with blood donation practice in the multivariable logistic regression analysis. Accordingly, college of the students (AOR = 3.247; 95% CI: 1.348–7.820), not taking part in blood donation campaigns (AOR = 0.285; 95% CI: 0.161–0.503), knowledge of blood bank location (AOR = 5.297; 95% CI: 3.081–9.110), knowledge about blood donation (AOR = 2.035; 95% CI: 1.123–3.686) and attitude toward blood donation (AOR = 2.266; 95% CI: 1.122–4.577) were the independent factors of blood donation practice. The odds of blood donation were 3.2 times more likely for the students in Institute of Language Studies and Journalism than health science students. Those students who did not take part in blood donation campaigns were 71.5% less likely to donate blood as compared to their counterparts. Students who know the blood bank location in the current or previous residential areas had 5 times more odds of blood donation than their counterparts. Similarly, those students who had good knowledge about blood donation had practiced blood donation 2 times more likely than those who had poor knowledge of blood donation. In addition, the students who had favorable attitude regarding blood donation had 2.2 times more odds of blood donation compared to their counterparts (Table 5).

Discussion

This study was aimed to assess the magnitude of blood donation practice and associated factors among university students. The study showed that 147 (40.8%) of the students have ever donated blood in their lifetime. This result is greater than the findings of the study in Debre Markos (16.1%),³⁵ Mizan-Aman Health Sciences College (35.5%),²⁴ Aman sub city (26.4%),³⁸ Madda Walabu (18.4%),³⁹ Ambo University (23.6%),²⁸ and Gondar University students

Table 5 Factors Associated with Voluntary Blood Donation Practice Among Wollega University Regular Students, Ethiopia, 2021 (n = 360)

Variables	Category	Ever Donated		Bivariable		Multivariable	
		No=N (%)	Yes=N (%)	P-value	COR with 95% CI	P-value	AOR with 95% CI
Age	16–20	45(72.6%)	17(27.4%)	Ref	Ref	Ref	
	21–25	156(58.0%)	113(42.0%)	0.005*	0.267(0.106–0.673)	0.155	1.741(0.810–3.738)
	26–30	12(41.4%)	17(58.6%)	0.091	0.511(0.235–1.113)	0.143	2.524(0.731–8.714)
Gender	Female	78(58.6%)	55(41.4%)	0.878	1.035(0.670–1.599)		
	Male	135(59.5%)	92(40.5%)	Ref	Ref		
Marital status	Single	176(58.7%)	124(41.3%)	Ref	Ref		
	Married	16(59.3%)	11(40.7%)	0.952	0.976(0.43–2.175)		
	In relationship	21(63.6%)	12(36.4%)	0.582	0.811(0.385–1.709)		
Previous area of residence	Urban	112(59.6%)	76(40.4%)	Ref	Ref		
	Rural	101(58.7%)	71(41.3%)	0.869	1.036(0.680–1.578)		
College	Health science	143(59.8%)	96(40.2%)	Ref	Ref		
	Business and economics	50(65.8%)	26(34.2%)	0.354	0.775(0.451–1.329)	0.188	1.638(0.785–3.420)
	Institute of language studies and journalism	20(44.4%)	25(55.6%)	0.058*	1.862(0.980–3.540)	0.009**	3.247(1.348–7.820)
Year of study	1st year	42(68.9%)	19(31.1%)	Ref	Ref		
	2nd year	61(61.0%)	39(39.0%)	0.315	1.413(0.720–2.775)	0.544	0.770(0.330–1.792)
	3rd year	91(58.7%)	64(41.3%)	0.169	1.555(0.829–2.917)	0.417	0.721(0.327–1.590)
	4th year	19(43.2%)	25(56.8%)	0.009*	2.909(1.299–6.512)	0.466	1.477(0.518–4.210)
Religion	Orthodox	62(60.8%)	40(39.2%)	Ref	Ref		
	Muslim	32(65.3%)	17(34.7%)	0.592	0.823(0.405–1.675)		
	Protestant	110(56.7%)	84(43.3%)	0.499	1.184(0.726–1.929)		
	Catholic	3(60.0%)	2(40.0%)	0.972	1.033(0.165–6.460)		
	Other	6(60.0%)	4(40.0%)	0.961	1.033(0.274–3.892)		
Father's ever attended school	No	50(51.5%)	47(48.5%)	Ref	Ref	Ref	Ref
	Yes	163(62.0%)	100(38.0%)	0.075*	0.653(0.408–1.044)	0.476	0.807(0.448–1.455)
Mother's ever attended school	No	80(56.7%)	61(43.3%)	0.452	1.179(0.767–1.812)		
	Yes	133(60.7%)	86(39.3%)	Ref	Ref		
Monthly pocket money	0–500	150(62.8%)	89(37.2%)	Ref	Ref		
	501–1000	48(55.8%)	38(44.2%)	0.258	1.334(0.809–2.200)	0.179	1.530(0.822–2.847)
	>1000	15(42.9%)	20(57.1%)	0.027*	2.247(1.095–4.612)	0.072	2.397(0.926–6.204)
Alcohol consumption	Yes	30(61.2%)	19(38.8%)	0.753	0.905(0.488–1.679)		
	No	183(58.8%)	128(41.2%)	Ref	Ref		
Chewing khat	Yes	11(45.8%)	13(54.2%)	0.174*	1.782(0.775–4.094)	0.920	0.938(0.266–3.305)
	No	202(60.1%)	134(39.9%)	Ref	Ref	Ref	Ref
Smoking cigarette	Yes	4(40.0%)	6(60.0%)	0.222*	2.223(0.616–8.021)	0.324	2.517(0.403–15.728)
	No	209(59.7%)	141(40.3%)	Ref	Ref		
Social media usage	Yes	206(59.5%)	140(40.5%)	Ref	Ref		
	No	7(50.0%)	7(50.0%)	0.479	1.471(0.505–4.287)		
Heard or seen about blood donation	Yes	181(58.8%)	127(41.2%)	Ref	Ref		
	No	32(61.5%)	20(38.5%)	0.707	0.891(0.487–1.628)		
Taken part in blood donation campaign	Yes	38(32.2%)	80(67.8%)	Ref	Ref	Ref	
	No	175(72.3%)	67(27.7%)	0.000*	0.182(0.113–0.293)	0.000**	0.285(0.161–0.503)
Know location of Blood bank	No	169(75.1%)	56(24.9%)	Ref	Ref	Ref	Ref
	Yes	44(32.6%)	91(67.4%)	0.000*	6.241(3.901–9.986)	0.000**	5.297(3.081–9.110)
Knowledge about blood donation	Poor	119(69.6%)	52(30.4%)	Ref	Ref		
	Good	94(49.7%)	95(50.3%)	0.000*	2.313(1.500–3.566)	0.019**	2.035(1.123–3.686)
Attitude toward blood donation	Unfavorable	55(72.4%)	21(27.6%)	Ref	Ref	Ref	Ref
	Favorable	158(55.6%)	126(44.4%)	0.009*	2.089(1.200–3.637)	0.023**	2.266(1.122–4.577)

Note: *p-value<0.25, **p-value<0.051.

Abbreviations: COR, crude odds ratio; AOR, adjusted odds ratio; CI, confidence interval; Ref, reference; N, number.

(12.5%),¹⁷ Nigeria (13.3%),²² Tanzania (30%).⁴⁰ However, this finding is lower than the one from the study conducted in Tigray (47.8%).²⁵ This might be due to the difference in study population as the study in Tigray was among the health professionals.

Regarding the practice of voluntary blood donation, 105 (71.4% and 29% among those donated and among the total participants respectively) were volunteers, which is comparable with the study conducted in Bale.^{27,39} However, this result is higher than 10.6% voluntary blood donation practice in Birbir town,¹⁸ 16.8% voluntary practice in Bahir Dar,³⁷ and 63.7% in Debre Markos' study.³⁵ The increment in this study could be due to the awareness creation and mobilization activities done in the University in collaboration with Nekemte blood bank. The observed difference might be also attributed to the difference in the study period and populations as social mobilization and awareness creation activities are increasing from time to time.

Of the 147 ever blood donors, only 17% donated the blood more than three times. This result is greater than the study in Debre Markos town (7.4%),³⁵ while it is consistent with the finding in Mizan Aman health science college (13%).²⁴ However, it is low when compared to the recommended regular (every three months) non-remunerated voluntary blood donation in sustaining the blood supply and overcome the shortage of blood.⁷ On top of this, majority of the blood donors (103 (70%)) were elapsed donors and it was greater than one year since they donated the blood. This value is far greater than the result in the study of Mizan Aman Health College.²⁴ This indicates that besides the improving status of regular blood donation from time to time, there is a need to work for the achievement of the country's blood need.

Among the non-blood donors, fear of anemia, being unfit to donate, and absence of transfusion need by relative or family members were some of the main reasons that hindered the blood donation in this study. Similar to this study, 16% of non-donors in the study of Mizan Aman health college mentioned that they were unfit to donate the blood.²⁴ Besides, significant proportion (38%) had no specific reason to not donate the blood in our study. This later group would donate the blood if someone approach and convince them.

Nearly half (52.5%) of the students in this study were knowledgeable about blood donation. The result is comparable with the study conducted in Assosa University (48.5%)⁴¹ but higher than the finding from Ambo University (40.4%).²⁸ The variation in the level of knowledge could be from the difference in the study period, and blood donation campaigns as about 1/3rd of the students in this study also witnessed blood donation campaigns.

In the current study, more than three-quarters (78.9%) of the respondents had favorable attitude towards blood donation. The finding was better when compared to the previous studies conducted in Assosa University (68.9%),⁴¹ Ambo University (47.6%),²⁸ and India (57.8%).⁴² The observed difference could be due to the difference in the study period as the attitude may change when time goes.

The odds of blood donation practice were 5 times more likely for those students who know the blood bank location in the current or previous residential area as compared to their counterparts. This is in line with the study conducted in Kampala that the availability and accessibility of blood donation centers have association with blood donation practice.⁴³ This could be due to the fact that knowledge of blood bank location will make the students become aware of where they should donate blood, and lacking the opportunity will also decrease motivation to donate blood. In another way, the practice of blood donation could lead the students to know the location of blood bank. Hence, it might be difficult to say whether this association is causal as this study is limited due to its cross-sectional nature of study design.

The odds of blood donation practice were 2 times more likely for those students who were knowledgeable compared to their counterparts. Besides, students having favorable attitude toward blood donation were also found to practice blood donation 2 times more likely than students who have unfavorable attitude. This finding was supported by the studies conducted in other parts of Ethiopia,^{3,24,25,39} and Kenya.⁴⁴ This could be explained by the fact that both knowledge and attitude are important precursors for the behavioral change and improved practice.

The odds of blood donation among students who did not participate in blood donation campaign were 71.5% less likely as compared to those participated in the campaign. This is in agreement with the study conducted in Bale Robe town.²⁷ The possible reason to this association is that taking part in blood donation campaign can make the students aware about the importance of blood donation. In turn, it might increase the students' motivation to donate blood.

Surprisingly, the likelihood of practicing blood donation was more likely for students from the Institute of Language Studies and Journalism than health science students. The possible justification could be that health science students stay frequently out of the campus for apparent ships. They could miss the blood collection campaign in the campus. Besides, the students in the Institute of Language Studies and Journalism might donate for relatives/replacement since this study

did not differentiate the blood donation practice into its categories (voluntary non-remunerated, replacement/relatives and paid donors). The association was checked for overall ever blood donation practice.

Limitation

The cross-sectional nature of the study could not ascertain the cause–effect relationship. Although the sample size was predetermined, it might be small and could affect the generalizability of this finding. Besides, the risk of recall bias would not be ruled out.

Conclusion

The 40.8% lifetime blood donation practice in this study was low. Particularly, the voluntary non-remunerated blood donation (29%) is less than the WHO recommendations of 100% non-remunerated voluntary blood donation practice by youngsters.³⁴ This low level of blood donation could result from lack of awareness regarding blood donation benefits, poor understanding of the impact of blood scarcity, and inadequate mobilization. College/institute of the students, lack of knowledge, poor attitude, and blood donation campaigns were found to be the factors influencing blood donation practice.

All health institutions whether private or governmental including the Wollega University Referral Hospital, Nekemte Blood Bank, Red Cross Society Nekemte branch, health bureaus in Nekemte town, and the university must work in coordination to increase the level of knowledge and to shift the attitudes towards positive regarding blood donation. On top of this, it is better if blood donation club is established in the campus in order to facilitate the awareness creation activities and to increase the number of regular voluntary blood donors. Periodic campaigns for community mobilization need to be strengthened to improve the low blood donation practice particularly to increase and sustain the number of regular blood donors. It would also be better if incentives like t-shirts and certificates were given to regular donors. To make willful contribution for life saving activities, it is better if the students engage actively in the blood donation campaigns and also donate their blood voluntarily.

Data Sharing Statement

Data are available on reasonable request from corresponding author.

Ethics Approval and Informed Consent

The study was conducted in accordance with the Helsinki declaration, and ethical approval was obtained from the Institutional Review Board (IRB) of Wollega University. Cooperation letter was written from Wollega University, Institute of Health Sciences. The purpose of the study was clearly explained to the respondents, and they were told that the confidentiality is kept strictly. The respondents were also told that they have the right to involve or not at all in the study. Finally, informed, voluntary, written and signed consent was secured from the study participants and no personal detail was needed to record on the questionnaire.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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