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Assessment of Knowledge, Attitude and Practice of Voluntary Blood Donation and Associated Factors among Residents of Birbir Town, Southern Ethiopia

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Abstract
Blood transfusion is a medical procedure that is designed to provide patients who need blood or blood products to correct a defect. Secure supply of safe blood components, based on voluntary, non-remunerated blood donation is an important national goal to prevent blood shortages. Now a day, in many low- and middle-income countries, blood supply is critically inadequate. Therefore, the objective of this study was to assess knowledge, attitude, and practice of voluntary blood donation and associated factors among adults of Birbir town residents. Community based cross sectional study design was employed among residents of Birbir town with 387 samples from July 1- 30, 2016. After proportional allocation to size to each of 4 villages, systematic sampling method was used to select households. Data was collected from all villages by investigators using standard questionnaire. Finally data was entered and analyzed using SPSS version 20 software. About 144 (38.3%), 170 (45.2%) and 40 (10.6%) of respondents have adequate knowledge, favorable attitude and donated blood respectively. Educational status and occupation were determinants of knowledge, age and knowledge were determinants of attitude and attitude was the only determinant of practice of voluntary blood donation. This study revealed that the prevalence of knowledge, attitude and practice of voluntary blood donation is low . There is a need to design and implement awareness creation program on blood donation. Offices of blood banks in the country, health offices and other stake holders should organize educational campaigns to build community awareness, positive attitude and boost voluntary blood donation among the communities.
Keywords: knowledge; attitude; practice; voluntary blood donation; Birbir; Southern Ethiopia; factors

1. INTRODUCTION

Blood is a specialized body fluid in humans that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells. Human blood is an element of human life. Blood transfusion is a medical procedure that is designed to provide patients who need blood or blood products to correct a defect. A blood donation occurs when a person voluntarily has blood drawn and used for transfusions and/or made into biopharmaceutical medications by a process called fractionation (separation of whole-blood components). Donation may be of whole-blood, or of specific components directly (the latter called aphaeresis).[Abderrahman and Saleh,2014] Blood banks often participate in the collection process as well as the procedures that follow it. Blood transfusion is an indispensable component of health care. It contributes to saving millions of lives each year in both routine and emergency situations, permits increasingly complex medical and surgical interventions and improves the quality of life of patients with a variety of acute and chronic conditions.[Atherley et al., 2016] National requirements for blood are determined by the capacity of the country's health care system and its coverage of the population .The demand for blood in a country depends on the population, health care structure, and prevalence of conditions requiring regular transfusions.[Central Statistical Agency and ICF International, 2012] The donated blood plays an essential role in the management of bleeding during major surgeries, accidents, deliveries, bleeding peptic ulcer, liver diseases, lung diseases, cancers, blood diseases such as hemophilia, severe anemia and Thalassemia, new born baby with blood diseases, burn etc.[Abderrahman and Saleh,2014] The prospective donor should be in a healthy state of mind and body. In the past one year he/she should not been treated for Rabies or received Hepatitis B immune globulin, similarly in the past six months he/she should not have had a tattoo, ear or skin piercing or acupuncture carried on him/her, not received blood or blood products, had no serious illness or major surgery, and not had contact with a person with hepatitis or jaundice. The prospective donor should in the past three months not donated blood or been treated for Malaria, and not had taken any immunizations in the preceding one month. In addition, in the past 48 hours he/she should not have taken any antibiotics or any other medications, and not taken an alcoholic beverage in the past 24 hours. On the day of donation, he/she should not have a cough, influenza or sore throat, or common cold. Prospective female should not be pregnant or breast feeding. Prospective donors should not have a history of Diabetes, chest pain, heart disease or high BP, cancer, blood clotting problems or blood disease, or unexplained fever.[Ethiopian Red Cross society, 2012] The eligible age range to donate blood is 18 years to 65 years and a weight greater than or equal to 45kg. The amount of blood collected in a single donation ranges between 350ml to 450 ml. The other eligibilities for a prospective donor to qualify to donate include hemoglobin

of more than or equal to 12 gm/dl for female and 13 gm/dl for male, and a blood pressure of between 100/50 mmHg-180/100 mmHG. The average time taken for collection of donor blood alone is about 5 to 7 minutes.[Ethiopian Red Cross society, 2012, Gebremeskel Mirutse et al., 2014] The role of healthy adults in voluntary blood donation is crucial to meet the demand of safe blood. Blood donation does not harm the donor and is safe for the body. In addition blood donation is a social/civic responsibility, as the donated blood will be used to save the lives of others in need. A donor may receive blood transfusion as a patient when a clinical need arises; so it is said that today's donor may be tomorrow's recipient.[Ethiopian Red Cross society, 2012] The International Federation of Red Cross and Red Crescent Societies (IFRC) 2012 report, indicates that 8 million more donations were recorded in 2011 when compared to 2004 [Gebremeskel Mirutse et al., 2014], however there is a shortage of active blood donors to meet the increased demands of blood. In order to achieve the Sustainable Development Goals(SDGs) 4 (Reduce child mortality) and 5(Improve Maternal health), reducing infant mortality & maternal mortality has been identified as the major intervention areas both globally and nationally.

Access to safe blood Due to blood loss every day about 800 women and about 15% of child die due to obstetric bleeding and anemia, respectively.[Gebremeskel Mirutse et al., 2014, Jacobs and Berege, 1995] Despite extensive health promotion to encourage blood donation, however, the donating population has remained consistently low at approximately 3% to 4% of the total population in some developed countries. These low rates of blood donation will likely result in future blood shortages as the demand for blood increases due to an aging population, the emergence of new medical and surgical procedures requiring blood transfusions, and further deferrals of individuals who pose a contamination risk to the blood supply.[Jacobs and Berege, 1995] In the WHO African region, it is estimated that about 8 million units of blood were required in 2006, but only 3.2 million units were collected. The African region frequently experiences man-made and natural disasters that considerably increase the need for blood. Unfortunately, many countries in the region do not collect sufficient blood for their populations. In 2006 , WHO estimated that 4.15 donations per 1000 population were recorded in developing countries, in developed countries an average of over 30 donations per 1000 population was reported in the same time.[Central Statistical Agency and ICF International, 2012] This shows that there is a significant difference in access to safe blood amongst the low- and high-income countries. In Ethiopia, Availability of blood for transfusion is limited, as is voluntary blood donation. Evidence relating to knowledge, attitudes and practices on blood donation among Ethiopians is also scarce. Although the Ethiopian Red Cross Society (ERCS) has been the body/organization that took the lead and initiative in improving blood banking services in the country, blood transfusion services in Ethiopia still rely on family and replacement donors.[Gebremeskel Mirutse et al., 2014] The WHO supported the restructuring of the blood transfusion services through the establishment of a National Blood Transfusion Service (NBTS) under the FMoH as well as transitioning of services from the ERCS to the FMoH, with a total of 25 blood banks that have been established to cover the transfusion needs of hospitals.[Jacobs and Berege, 1995]

This study will find the present situation of knowledge, Attitude & Practice and associated factors of voluntary blood donation among adults of Birbir town, Southern Ethiopia.

2. MATERIALS AND METHODS

2.1. Study area and period: This study was conducted in Mirab Abaya Woreda, Birbir town. Birbir town is found in M/Abaya Woreda, Gamo Gofa Zone. The town is found at a distance of 465 kilometers south from Addis Ababa, 204 kms south west from Hawassa the capital city of Southern Ethiopia and 46 kms south west from Arba Minch. It has one main road 16 that passes through the town from Addis Ababa. It is located at an altitude of 360-3300 meters above sea level & its average rainfall is 900 mm^3 per year. The town is surrounded in the north by Doronje Woreda, in the South by Mole Woreda, in the east by Alge Woreda, in the north east by Lake Abaya, in the West by DengoWoreda. The total area of the town is 37 hectares. It has 4 Ketenas , 8 eight villages, and 2,140 estimated numbers of households and the total population of 8,893; among this 4,468 (50.2%) are males and 4,425(49.8%) are females. The major dominant ethnic group in Birbir town is Gamo. The town has one health center, six private clinics, three pharmacy, 1 elementary school, 1 high school, 1 preparatory school, 1 private school (elementary), 1 Technical and Vocational Education and Training (TVET) college, postal services, telecommunication services & 1 bank (Mirab Abaya Administration Bureau, 2016). The study was conducted from July 1 to July 30, 2016.

2.2. Study population: All adults who live in Birbir town aged 18-65years.

2.3. Sample size and sampling techniques: The sample size for this study was calculated using single population proportion formula based on the following Assumptions: p= 40.4% (adequate knowledge on research conducted on the same topic among Ambo university students [Nigatu and Demissie, 2014], with 95% confidence level and 5% level of precision. So, total of 369 was calculated and by adjusting for 5 % non-

response rate, final sample size was 387.

After Proportional allocation to size to four villages, sample was drawn from all villages' eligible population in the Kebele. Systematic sampling method was used to select households. To get the individual sample unit at household level, the number of households in the Kebele with adults was divided to sample size which gives the interval k=6. The first house was selected by lottery method and the data was collected in every 6^{th} interval in each village. For households with two or more adults only one individual was selected by lottery method.

2.4. Data collection instrument and procedures: Data was collected using a pre-tested structured questionnaire adapted from literature.[Nigatu and Demissie, 2014] It was in English, translated to Amharic and then back to English to check for consistency, and completeness. Then it was collected through a face-to- face interview.

2.5. Data processing and analysis: after checking for completeness and consistency, data was entered in SPSS (IBM 20) and descriptive statistics, bivariate and multivariate analysis were done using binary logistic regressions. In order to identify determinants of dependent variables, the variables with $P \leq 0.25$ during bivariate analysis were candidate for multivariate analysis and variables with $P < 0.05$ in multivariate analysis were the final determinants of dependent variables. And the degrees of association between dependent and independent variables was assessed using AOR at 95% CI.

2.6. Ethical considerations: Ethical clearance was obtained from the ethical review committee of College of Medicine and Health Sciences, Arba Minch University. A formal letter was given to Birbir town administrative bureau. In addition, informed consent was obtained from study participants to confirm willingness for participation after explaining the objective of the study. And the respondents were notified that they have the right to refuse or terminate at any point of the interview.

3. RESULTS

3.1. Socio demographic result

From a total of 387 participants, 376 were interviewed with 97% response rate. The participants were between 18-65 years with a mean age of 32 years. Of the total participants, 213(56.6%) were males .The respondents predominantly were between the ages of 18 to 22 :- 83(22.1%). Regarding marital status of participants, 243(64.6%) were married. Of the total respondents interviewed, 205 (54.5%) were Protestant. Regarding occupation, 85 (22.6%) were merchants and among respondents, 129 (34.3%) had attended elementary school. The monthly income of 174(43.9%) of the respondents were between 501-100 ETB. (Table 1).

3.2. Knowledge on voluntary blood donation

Of total participants, only 47 (12.5%) know their own blood group. Of these, 17(36.6%) were blood group O^{+}. About 181(45.7%) responded that a person can be infected during blood transfusion. Of respondents, 295(78.5%) know that HIV can be transmitted through blood transfusion, about 81(21.5%) were not aware about HIV transmission through blood donation. One fourth (25%) of the respondents totally 94 were aware about transmission of hepatitis virus (HCV) through blood transfusion. More than two-third of the respondents i.e. 271 (68.4%) were not aware about transmission of malaria through blood transfusion and 236 (62.8%) were not aware about transmission of other STIs (Syphilis/Gonorrhea) through blood transfusion. 271(72.1%) of the respondents did not know how often an individual can donate blood. When asked about who should donate blood, 247(65.7%) responded it should be a male individual.(Table 2).

Concerning the overall level of knowledge of voluntary blood donation, 144 (38.3%) of the respondents have adequate knowledge and the remaining 232(61.7%) have inadequate knowledge.

3.3. Attitude on voluntary blood donation

Of the total respondents, 334(88.8%) considers blood donation as good, 147 (39.1%) said donating for money is the best source of motivation for donation. Of the participants, 237(63%) think there are associated risks during and after blood donation. About 304(80.9%) respondents were of the opinion that the patients' relative should be asked to donate blood. A total of 208(55.3%) respondents will encourage others to donate blood. About 198(52.7%) are volunteers who will want to be reminded or called up on to donate when they are due. (Table 3).
In the study, 206 (54.8%) of respondents have unfavorable attitude and 170(45.2%) have positive attitude towards voluntary blood donation.

3.4. Practices on voluntary blood donation

Concerning practice, of the total study participants, only 40(10.6%) donated blood. The remaining 336(89.4%) had no practice of blood donation. From those individuals who donated, 24(6.4%) donated once a year and the

remaining donated more than once (Fig 1).

3.5. Factors associated with knowledge, Attitude and practice of voluntary blood donation

3.5.1. Factors associated with Knowledge of voluntary blood donation

Further analysis of the factors associated with knowledge of voluntary blood donation revealed that educational status and occupation of respondents were independent determinants of Knowledge of voluntary blood donation. While only 6.7% of participants with educational status of being able to read and write has adequate knowledge about voluntary blood donation, 24.8% of 1-8 grade, 44.1% of 9-12 grade and 68.5% of 12 and above have adequate knowledge of voluntary blood donation. Participants with educational status of being able to read and write are less likely to have adequate knowledge about voluntary blood donation than participants with educational status of 12 and above grade (AOR=0.080; 95% CI=0.020, 0.317).

Likewise, the odds of having adequate knowledge about voluntary blood donation for participants with educational status of 1-8 grade is less than participants with educational status of 12 and above (AOR=0.320; 95% CI=0.159, 0.642). And participants with educational status of 9-12 grade are less likely to have adequate knowledge about voluntary blood donation than participants with educational status of 12 and above (AOR=0.460; 95% CI=0.247, 0.856).

The other important determinant factor for knowledge of voluntary blood donation was occupation. While only 8.7% of house wives and only 14.5% of farmers have adequate knowledge about voluntary blood donation, 65.8% of Government employees, 44% of Students, 45.9% of Merchants and 60% of with other occupation have adequate knowledge.

When compared with government employees, students are less likely to have adequate knowledge about voluntary blood donation (AOR=0.514; 95% CI=0.260, 1.013).

Similarly, the odds of having adequate knowledge about voluntary blood donation for merchants (AOR=0.671; 95% CI=0.336, 0.1.343), farmers (AOR=0.231; 95% CI=0.079, 0.678), housewives (AOR=0.098; 95% CI=0.033, 0.295) and with other occupation (AOR=1.464; 95% CI=0.340, 6.316) is less than government employees (Table 4).

3.5.2. Factors associated with attitude towards voluntary blood donation

Analysis on factors associated with attitude towards voluntary blood donation had shown that age and knowledge of respondents were independent determinants of attitude towards voluntary blood donation.

While 51.8% of respondents of age 18-22 have positive knowledge, 63.5% of 23-27, 50% of 28-32, 34.6% of 33-37, 41.8% of 38-42, 24.1% of 43-47, 20% of 48-52, 25% of 53-57 and none of 58-65 years have positive knowledge. Respondents of age 33-37 years are less likely to have positive attitude towards voluntary blood donation than respondents of age 18-22 (AOR=0.450; 95% CI=0.217, 0.935). Similarly the odds of having positive attitude toward voluntary blood donation for respondents of age 43-47 years is less when compared to respondents of age 18-22 years (AOR=0.318; 95% CI=0.121, 0.835).

The other important determinant factor for attitude towards voluntary blood donation was knowledge of voluntary blood donation of respondents. While 59% of respondents with adequate knowledge of voluntary blood donation have positive attitude towards voluntary blood donation only 36.6% of respondents with inadequate knowledge have it.

Respondents with adequate knowledge of voluntary blood donation have positive attitude 2 times more likely than respondents with inadequate knowledge (AOR=2.153; 95% CI=1.374, 3.375) (Table 5).

3.5.3. Factors associated with practice of voluntary blood donation

Further analysis on factors associated with practice of voluntary blood donation revealed that attitude towards voluntary blood donation was the only independent determinant of practice of voluntary blood donation. While 16.5% of respondents with positive attitude voluntarily donated blood only 5.8% of respondents with unfavorable attitude did it. The odds of donating blood voluntarily is 3 times higher for respondents with positive attitude than respondents with unfavorable attitude (AOR= 3.188; 95% CI= 1.567,6.484) (Table 6).

4. DISCUSSION

This community based cross sectional study has investigated the knowledge, attitude and practices and associated factors of voluntary blood donation (VBD) among residents of Mirab Abaya Woreda, Birbir town.

Accordingly, only 38.3% of the respondents were knowledgeable about voluntary blood donation. This is similar to the finding of the study conducted in Congo where the knowledge of the respondents was 39%,[Kabinda et al., 2014] and our finding is higher than the finding of the study conducted in Jordan where only 28.6% of participants had adequate knowledge of VBD.[Melku et al., 2016] This might be because of the year gap between the two studies. Our finding is far lower than the finding of the study conducted in Debre Markos, Northern Ethiopia and Gondar, Northwest Ethiopia, where 56.5% and 56.8% respectively are knowledgeable about blood donation.[Nigatu and Demissie,2014, WHO, 2014] This might be because our study is limited to a small town where as those studies are done in relatively big cities where more educated peoples

reside than our study area.

In our study, as the educational status of the respondents increase the more they have knowledge about voluntary blood donation. This is similar to the finding of the study conducted in Barbados where knowledge score of blood donation was higher for those who had achieved a higher education status.[WHO, 2012] This might be because as the educational status of individuals increase obviously the chance of acquiring knowledge about a specific subject will increase.

Even if we don't have similar finding in other studies, the other important determinant for knowledge of voluntary blood donation in our study was occupational status of the respondents. This might because in the Ethiopian context, the type of occupation is usually related to the education status of an individual.

This study revealed that of the total respondents who participated in the study, only 45.2% had positive attitude towards voluntary blood donation. This finding is lower than the fining of the study done in Debre Markos, Northern Ethiopia where 52.2% of respondents have favorable attitude towards blood donation.[Nigatu and Demissie, 2014] This might be attributable to that fact that Debre Markos is a big city and our study area is small town.

In this study, knowledge of the respondents about voluntary blood donation was a determinant factor for positive attitude towards voluntary blood donation.

This is similar to the finding of the study done in Barbados where total knowledge scores of blood donation statistically significantly predicted total attitude scores towards blood donation.[WHO, 2012] The other variable which we couldn't identify in another research finding but also was a determinant of attitude towards voluntary blood donation was age of respondents. This might because when the age of individuals increases the experience and exposure to different things will increase and this might have a significant effect on attitude of individuals.

In this study, among the total respondents, only 10.6% had donated blood voluntarily. This finding is almost similar to the finding of the study conducted in Mekelle City where only 12% had history of blood donation.[WHO, 2016] Our finding is higher than the finding of the study conducted in Tanzania where only 3.8% had donated voluntarily.[WHO, 2016] This might be because our study included only urban residents whereas the study in Tanzania had included both urban and rural residents and the time gap between the studies could be also the reason for the difference. Our finding is far below the finding of the study conducted in Barbados where 53% of participants had previously donated blood.[WHO,2012] This might be because the study in Barbados is nationwide whereas our study is only limited to one small town in Southern Ethiopia. Concerning the determinant factors for voluntary blood donation, in our study, the attitude of respondents for voluntary blood donation was the only determinant variable. This finding is similar to the finding of the study conducted in Barbados where total attitude scores for blood donation predicted total practice scores for blood donation.[WHO,2012]

4.1. CONCLUSION AND RECOMMENDATIONS

This study revealed that the prevalence of knowledge, attitude and practice of voluntary blood donation is found to be low in Birbir town. Educational status and occupation were determinants of knowledge, age and knowledge were determinants of attitude and attitude was the determinant of practice of voluntary blood donation.

Offices of blood banks in the country, health offices and other stake holders should organize educational campaign to build community awareness, positive attitude and boost voluntary blood donation among the communities.

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Figure Legend

Figure 1: Practice on their life time of voluntary blood donation among residents of Birbir town, 2016.

Table 1: Socio demographic characteristics of Birbir town residents, 2016.

Variable		Frequency	Percent (%)
Age	18-22	83	22.1
	23-27	63	16.8
	28-32	70	18.6
	33-37	52	13.8
	38-42	55	14.6
	43-47	29	7.7
	48-52	10	2.7
	53-57	8	2.1
	58-65	6	1.6
Sex	Male	213	56.6
	Female	163	43.4
Marital status	Married	243	64.6
	Single	117	31.1
	Divorced	8	2.1
	Widowed	8	2.1
Educational status	Unable to read &write	11	2.9
	able to read & write	45	12
	1-8 grade	129	34.3
	9-12 grade	102	27.1
	12+	89	23.7
Religion	Protestant	205	54.5
	Orthodox	140	37.2
	Muslim	17	4.5
	Others	14	3.7
Ethnicity	Gamo	240	63.8
	Wolaita	103	27.4
	Gofa	21	5.6
	Others	12	3.2
Occupation	Government employee	73	19.4
	Merchants	85	22.6
	Farmers	55	14.6
	House wife	69	18.4
	Students	84	22.3
	Others	10	2.7
Monthly income	0-500	174	46.3
	501-1000	38	10.1
	1001-1500	21	5.6
	1501-2000	34	9.0
	2000+	109	29.0

Table 2: Knowledge on voluntary blood donation among residents of Birbir town, 2016.

Variables		Frequency	Percentage (%)
How many blood types do you know?	1	20	5.3
	2	103	27.4
	3	49	13.0
	4	204	54.3
Do you know your blood group?	Yes	47	12.5
	No	329	87.5
If yes what is your blood group?	A+	8	17
	A-	3	6.4
	B+	6	12.8
	B-	6	12.8
	AB	5	10.6
	O+	17	36.2
	O-	2	4.3
Can a person be infected by receiving blood transfusion?	Yes	181	48.1
	No	110	29.3
	I don't know	85	22.6
Can HIV be transmitted through blood transfusion?	Yes	134	74.0
	No	47	26.0
Can Hepatitis be transmitted through blood transfusion?	Yes	45	25
	No	136	75
Can other STIs transmitted through blood donation?	Yes	22	12
	No	159	88
Can malaria be transmitted through blood transfusion?	Yes	40	21.8
	No	141	78.2
Can other disease be transmitted by blood donation?	Yes	51	27.9
	No	130	72.1
How often can individual donate?	Weekly	6	1.6
	Monthly	11	2.9
	Three monthly	105	27.9
	six monthly	92	24.5
	Annually	47	12.5
	I don't know	115	30.6
Can males donate blood?	Yes	247	65.7
	No	129	34.3
Can females donate blood?	Yes	103	27.4
	No	273	72.6
Can younger individuals (<18yrs) donate blood?	Yes	14	3.7
	No	362	96.2
Can older individuals (>60yrs) donate blood?	Yes	54	14.4
	No	322	85.7
Can vulnerable group donate blood?	Yes	17	4.5
	No	359	95.4
Can healthy individuals donate blood?	Yes	374	99.5
	No	2	0.5
Can diseased individuals donate blood?	Yes	3	0.8
	No	373	99.2

Table 3: Attitude towards voluntary blood donation among residents of Birbir town, 2016.

Variables		Frequency	Percent's (%)
what is your thinking toward blood donation?	Good	334	88.8
	Bad	20	5.3
	no idea	22	5.9
do you think there is an associated risk during and after blood donation	Yes	237	63
	No	90	23
	I don't know	49	13
will you donate if called up on or remind to do so?	Yes	198	52.7
	No	178	47.3
what is the main source for blood donation?	donating willingly	143	38
	donate to replace blood	66	17.6
	donate with money	147	39.1
	I don't know	20	5.3
should patient relative be asked to donate blood?	Yes	304	80.9
	No	32	8.5
	I don't know	40	10.6
do you encourage others to donate blood?	Yes	208	55.3
	No	168	44.7

Table 4 : Determinants of knowledge on voluntary blood donation among residents of Birbir town, Southern Ethiopia, 2016.

Variables	n(%)	Have adequate knowledge	Crude odds ratio (95% CI)	Adjusted odds ratio (95%CI)
Educational status		3(27.3%)	0.172(0.042,0.698)	0.853(0.168,4.334)
Unable to read &write	11(2.9%)			
able to read & write	45(12.0%)	3(6.7%)	0.033(0.009,0.115)	0.080(0.020,0.317)
1-8 grade	129(34.3%)	32(24.8%)	0.151(0.083,0.276)	0.320(0.159,0.642)
9-12 grade	102(27.1%)	45(44.1%	0.362(0.200,0.656)	0.460(0.247,0.856)
12+ grade	89(23.7%)	61(68.5%)	1	1
Occupation				
Government employee	73(19.4%)	48(65.8%)	1	1
Students	84(22.3%)	37(44.0%)	0.410(0.215,0.783)	0.514(0.260,1.013)
Merchant	85(22.6%	39(45.9%)	0.442(0.232,0.841)	0.671(0.336,1.343)
Farmer	55(14.6%)	8(14.5%)	0.089(0.036,0.216)	0.231(0.079,0.678)
House wife	69(18.4%)	6(8.7%)	0.050(0.019,0.130)	0.098(0.033,0.295)
Others	10(2.7%)	6(60.0%)	0.781(0.202,3.027)	1.464(0.340,6.316)

Table 5: Determinants of attitude towards voluntary blood donation among residents of Birbir town, Southern Ethiopia, 2016.

Variables	n(%)	Have positive attitude	Crude odds ratio (95% CI)	Adjusted odds ratio (95%CI)
Age				
18-22	83(22.1%)	43(51.8%)	1	1
23-27	63(16.8%)	40(63.5%)	1.618(0.828,3.160)	1.349(0.678,2.685)
28-32	70(18.6%)	35(50.0%)	0.930(0.492,1.758)	0.777(0.403,1.498)
33-37	52(13.8%)	18(34.6%)	0.492(0.241,1.007)	0.450(0.217,0.935)
38-42	55 (14.6%)	23(41.8%)	0.669(0.336,1.329)	0.647(0.322,1.301)
43-47	29(7.7%)	7(24.1%)	0.296(0.114,0.768)	0.318(0.121,0.835)
48-52	10(2.7%)	2(20.0%)	0.233(0.047,1.161)	0.223(0.044,1.136)
53-57	8(2.1%)	2(25.0%)	0.310(0.059,1.626)	0.348(0.065,1.851)
58-65	6(1.6%)	0(0.0%)	0	0
Knowledge	232(61.7%)	85(36.6%)	1	1
Inadequate				
Adequate	144(38.3%)	85(59.0%)	2.492(1.627,3.816)	2.153(1.374,3.375)

Table 6 : Determinants of practice on voluntary blood donation among residents of Birbir town, Southern Ethiopia, 2016.

Variable	n(%)	Voluntarily donated blood	Crude odds ratio (95% CI)	Adjusted odds ratio (95%CI)
Attitude				
Unfavorable attitude	206(54.8%)	12(5.8%)	1	1
Positive attitude	170 (45.2%)	28(16.5%)	3.188(1.567,6.484)	3.188(1.567,6.484)

Figure 1