

# Voluntary Blood Donation Practice and Associated Factors among Civil Servants in Chiro Town of Western Hararghe Zone, Eastern Ethiopia: a Cross-sectional study

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## Research article

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## Abstract

**Background** Despite blood transfusion has been available for the past 200 years; there is still a significant shortage of blood and blood products especially in low and middle income countries. In 2016 national blood demand of Ethiopia was estimated to be one million units per year, while only 17.4% (173,930) units of blood collected in the same year. Out of 25,400 units of blood requirement per year in West Hararghe, only 2750 units (10.8%) was collected in 2016 and 80% of these were from Civil servants. The aim of the study was to assess voluntary blood donation practice and associated factors among Chiro Town's civil servants in 2018.

**Methods** A cross-sectional study was conducted on 383 civil servants selected by multistage sampling technique. Data were collected using self-administered and pre-tested questionnaire. Data was analyzed using SPSS version 20 and binary logistic regression was performed to assess the association between determinant factors and voluntary blood donation practice. Adjusted odds ratios (AOR) with its 95% confidence interval (CI) were estimated to identify factors associated with the outcome variables in the multivariable analysis. A  $P < 0.05$  and AOR with 95% CI were used to report significance and strength of multivariable association, respectively. Results The life-time voluntary blood donation practice among civil servants was 43.7% (38.3, 49.3). Having willingness to donate, [AOR=2.54; 95%CI=1.39, 4.65], being knowledgeable about blood donation [AOR=3.32; 95%CI=2.02, 5.46] and listening to mass media [AOR=1.83; 95%CI=1.01, 3.35] were variables significantly associated with voluntary blood donation practice.

**Conclusions** This study shows poor Voluntary Blood donation practice while, having knowledge, willingness and access to mass media are attributable factors for blood donation practice in the study area.

## Background

Blood still remains an entity that has not been made artificially in laboratory and needs to be replaced for a patient in need by another healthy human being. Blood transfusion is the transfer of blood or blood products from the donor to the receiver's bloodstream (11). It is a life-saving artifice to replace lost blood cells or blood components due to bleeding in both routine and emergency situations (12). The blood donation from health individual is the only source of blood but the recruitment of voluntary donors is the most important problem throughout the world (8). Demand for blood is alarmingly rising, because of increased life expectancy, utilization of newly expanded invasive procedures, increase in accidents and chronic non communicable diseases, which need transfusion but currently the demand outweighs the supply (17). Globally over 81 million units of blood are collected annually, but only 39 % of this is collected in low and middle income countries which have 82% of the world's population (6). High-income countries collect around 35 donations per 1000 population per year. Sub-Saharan Africa has the lowest blood donation rates and 40 African countries have collect less than 10 blood donations per 1000 population per year; of these, 25 countries collect less than half of blood that they need to meet transfusion requirements (2). The 2017 WHO fact sheet reviewed that, in low-income countries up to 65% of blood transfusions are given to children under 5 years of age(5); whereas in high-income countries the most frequently transfused age groups are those over 65 years(14). In Ethiopia it is challenging to get a sufficient number of voluntary blood donors and the current blood supply is far less compared to the demand (14). Annually 25% to 40% of Ethiopian mothers die due to lack of blood donation which is needed for the maternal morbidity complications (15). In 2016 national blood demand of Ethiopia was estimated to be one million units per year, while only 17.4% (173,930) units of blood

collected in the same year. Out of 25,400 units of blood requirement per year in West Hararghe, only 2750 units (10.8%) was collected in 2016 and 80% of these were from Civil servants. This imbalance of supply and need could be attributed to lack of awareness, poor attitude and blood donation practice regarding voluntary blood donation. Therefore, the assessment of the status of blood donation practice and associated factors among civil servants may help to strengthen the blood donation program. In this study, we assessed Blood donation practice and associated factors among civil servants in Chiro town.

## **Methods**

### **Study design, area and period**

A Cross-sectional study was conducted in Chiro town Western Hararge, Oromia regional state, from March 1 to April 20, 2018. Chiro town is located on 317 Km from the capital city Addis Ababa.

### **Study Population**

Source populations were all civil Servants employed in western Hararge zonal sectors while Study populations were Civil Servants in 12 randomly selected zonal sectors. Participants with age group of 18-65years and non-pregnant women were included to study.

### **Sample size and sampling technique**

There were a total of 31 zonal offices and 1001 civil servants in Chiro Town, among those 12 offices were selected by simple random sampling. Epi-Info version 7 was used to calculate the sample size with the Confidence Interval 95%, Power=80% and the ratio of unexposed to exposed almost equivalent to calculate the final sample size and 403 was taken as final sample size. The study participants was selected by simple random sampling by using their list as sampling frame from each office's human resource directorate.

### **Data collection and procedure**

Data were collected by four degree nurses and two master's degree holder in MPH. The principal investigator was followed the data collection process closely. Self-administered structured questionnaires were first developed in English then translated to local language (Afaan Oromo) and translated back to English by two independent translator.

### **Data processing and analysis**

After the data had been checked for completeness and internal consistency, the data were coded and double entered into Epi- Data Version-3.1 computer software package and cleaned for inconsistency. For further analysis, data were exported to Statstical package for social science version 22 software. The descriptive statistics was used to describe the data. Those variables yield the  $P < 0.05$  was candidate for multivariate analysis. The collinarity effect was checked using variance inflation factor (VIF) and non-collinear covariates were included in the independent binary logistic regression model. All covariates that were significant at  $p < 0.05$  in bivariate analysis were considered for further multivariate analysis. Finally multivariate logistic regression model was used to identify predictors of outcome and control of confounding variables. Both the

crude odds ratio and adjusted odds ratios (AORs) were reported with their 95% confidence interval (CI), and *P*-value  $\leq 0.05$  was considered for statistical significance for all statistical tests. The model was tested by Hosmer-Lemeshow goodness of fit test.

## Results

### Socio-demographic characteristics of participants

A total of 383 respondents were participated on the study yielding 95% response rate. One hundred ninety six (51.2%) participants were in the age group of 26- 35 years and their median age were 33 ( $\pm 9$ SD) years. The majority, 274 (71.5%) and about two third, 251(65.5%) of participants were male and currently married, respectively. About three fourth, 287(74.9%) of study participants were Oromo by ethnicity (Table 1).

### Blood donation Practice

More than half, 219(57.8%) of participants are knowledgeable about blood donation and two third, 234 (61.1%) have positive attitude toward blood donation. At least one time prevalence of blood donation practice was about 43.6% (167) in the study area. The majority, 295(77%) of participants had willingness to donate blood. From 167(43.6%) who donated blood, nearly two third, 106(63.5%) and one third; 61(36.5%) of civil servants were donated their blood one time and more than two times in their life time respectively. About 21(27.3%) of donors were donating blood regularly (Table 2).

About three fourth 285 (74.4%) of study participants were listen advocacy of blood donation on mass media/Broad casting [Mean $\pm$  SD (0.74 $\pm$ 0.437)]. Out of those who donated blood 167(43.7%), 82.2% were follow mass media/Broadcasting advocacy on blood donation. One fourths (26.4%) of study participants use internet on their own mobile phone to know about blood donation. About 53% of civil servants were received blood donation related information from mass media, 32% from previous donor to donor communication, 11% from leaflets and posters and 4% from newspaper. More than half (59.4%) of study participants were responded that media reporting on HIV test results of blood donors was not good and 40.6% were responded good. Out of participants those who donated blood 73.7% responded that media reporting on HIV test results of blood donors was not good and 26.3% responded good to media reporting HIV test results of blood donors (Table 2).

### Factors associated with blood donation practice.

From multivariate analysis, the odds of donating blood increase by 2.5 times among those having willingness to donate the blood than those don't have the willingness [AOR=2.54 (1.39, 4.65)]. Blood donation practice were about 3.32 times significantly higher among civil-servants who were knowledgeable about blood donation compared to those who were not [AOR=3.32 (2.02, 5.46)] and 1.83 times higher among those who listen blood donation advocacy on mass medias [AOR=1.83(1.01, 3.35)] (Table 3).

## Discussion

The study finding showed that life time blood donation among civil servants was 43.6% which was consistent with cross sectional study conducted among workers in Topiwala and descriptive study conducted in Vellore District, Tamilnadu, South India where 47.7% and 49% respectively. In contrast it was higher than the other studies conducted in different cities of Ethiopia, Addis Ababa 32.6%, Harar 22.6%, Bahirdar 10.6% and Aman 26.4%,(1, 3, 7, 9, 10, 13). Possible reason for this discrepancy may be due to variation in desired characteristics and the study populations.

Out of those who donated blood 63.5% were donated once in their life time. This finding is similar to the study conducted in Ghana where 64% of donor participants donated blood once in their life time and higher than the study among residents of Birbir town which was 6.4% of donor participants donated blood one time (1). This might be due to difference in study subjects and also because of Civil servants may have up dated information concerning the blood donation.

In this study 80.24% were donated blood voluntarily. This finding is higher than the study done in Aman and Addis Ababa where 27.3% and 15.6% of donor participants donate blood voluntarily (3,7). This inconsistency might be due to increased number of regular donors, since regular donors are more likely to be volunteer. So that this finding suggest that there is improvement from paid and replacement blood donation to voluntary blood donation, but it is still less as compared to national requirement and World Health Organization recommendation.

Having willingness of blood donation was positively associated with blood donation practice in this study (AOR=1.90 95%CI: 1.01, 3.55). Those civil servants who had willingness for blood donation were two times more likely to donate blood as compared to those who had no willingness. This has similarity to the analysis study done in Spain and Kenya, where lack of willingness was significant reason for not donating blood (AOR=4.33 95%CI: 2.68, 6.99) (9, 24).

In our study, 76.65% of participants those donated blood has adequate knowledge. This is higher than the study finding in India where mean knowledge score of blood donated participants was 19.84% and in line with the study conducted in Aman city where 76.0% of donor participants had adequate knowledge about blood donation (7, 17). Being knowledgeable on blood donation was positively associated with blood donation practice (AOR=3.55 95%CI: 2.19, 5.74). Participants who were knowledgeable on blood donation was four times more likely to donate blood as compared to those not knowledgeable on blood donation. This is in line with finding of cross-sectional study conducted in Debre Markos town where odds of blood donation was higher (AOR = 3.17 95 % CI: 1.90, 5.28) among knowledgeable respondents compared to their counterparts (16).

In this study, 86.2% of donor participants listen mass media and those who listen mass Medias were two times more likely to donate blood as compared to those don't listen. This finding was nearly similar with the finding of community-based cross-sectional study conducted in Harar city where 77.7% source of information for donor participants was mass media (16).

## Conclusions And Recommendation

In this study, Practice of blood donation was found to be low as compared to World Health Organization recommendations. Willingness to donate blood, knowledge on blood donation and listening mass media were statistically significant variables with Practice of blood donation.

Based on the major findings of this study, in order to optimize willingness of blood donation among civil servants, Chiro blood bank and health sector organizations should educate Civil servants on blood donation using information, education and communication materials. Mass Medias should work more on educational and promotional advocacy on blood donation in collaboration with blood banks and Health facilities.

## Abbreviations

AIDS: Acquired Immunodeficiency Syndrome; AOR: Adjusted Odds Ratio; CI: Confidence Interval; EDHS: Ethiopian Demographic and Health Survey; HIV: Human Immunodeficiency Virus, MPH: Masters of Public Health; WHO: World Health Organization.

## Declarations

### Ethics approval and consent to participate

The study protocol was reviewed and approved for ethical clearance by Institutional Health Research Ethical Review Committee of Haramaya University College of Health and Medical Science. Informed written consent was obtained from each participants prior to data collection and Study participants' personal identifiers were not collected to keep confidentiality.

### Consent for publication

'Not applicable '

### Availability of data and material

The datasets used for analysis are available from the corresponding author on reasonable request.

### Competing interests

The authors declare that there is no conflict of interest.

### Funding

Not applicable

### Authors' contributions

SN participated in inception of idea, proposal development, data collection, analysis, and final write up. TG, HM and HA have participated in the amendment of proposal, statistical analysis and the write up of final

result. GF have participated on the write up of manuscript. All authors approved the final manuscript.

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## Tables

Table 1: Characteristics of participants in Chiro Town of Western Hararghe zone, Eastern Ethiopia, 2018 (n=383)

Characteristics		Frequency	Percentage (%)
Age categories in years	18-25	39	10.2
	26-35	196	51.2
	36-45	118	30.8
	>45	30	7.8
Sex	Male	274	71.5
	Female	109	28.5
Ethnicity	Oromo	287	74.9
	Amhara	77	20.1
	Gurage	19	5.0
Marital status	Married	251	65.5
	Single	87	22.7
	Divorce	28	7.3
	Widowed	17	4.4
Religion	Muslim	161	42.0
	Orthodox	152	39.7
	Protestant	70	18.3
Educational status	Secondary school and below	15	3.9
	Diploma level	51	13.3
	1 <sup>st</sup> Degree	276	72.2
	2 <sup>nd</sup> Degree/masters	41	10.7
working position	Manager	40	10.4
	Expertise	306	79.9
	Supportive	37	9.7
Current monthly salary ( in ETB)	<3000	31	8.1
	>=3000	352	91.7

**Table 2:** Blood donation knowledge, attitude and practice of voluntary blood donation practice among participants in Chiro Town of West Hararghe zone, Eastern Ethiopia, 2018 (n=383)

<b>Characteristics</b>		<b>Frequency (N)</b>	<b>Percentage (%)</b>
Knowledge status (on blood donation)	Knowledgeable ( $\geq$ Mean)	219	57.2
	Not Knowledgeable ( $<$ Mean)	164	42.8
	<i>Mean<math>\pm</math>SD</i>		6.57 ( $\pm$ 1.48SD)
Attitude status (on blood donation)	Positive ( $\geq$ Mean)	234	61.1
	Negative ( $<$ Mean)	149	38.9
	<i>Mean<math>\pm</math>SD</i>		5.66 ( $\pm$ 2.05SD)
Blood donation willingness	Yes	295	77.0
	No	88	23.0
Blood donation practice	Donated/Yes	167	43.6
	Not Donated/No	216	56.4
Donors information sources	Mass media	88	53
	Donors	54	32
	Posters and Leaflets	18	11
	News paper	7	4
Number of previous blood donation (n=167)	Once	106	63.3
	Twice and above	61	36.5
Previous blood donation interval (n=167)	Three months	21	27.3
	Not three months	167-21	72.3
Main reason to donate blood (n=167)	External force	34	20.2
	Internal satisfaction	133	79.8

Table 3: Multivariate logistic regressions of factors associated with blood donation practice among civil servants of chiro town of west hararghe zone, eastern Ethiopia, 2018 (n=383)

Factors		Blood Donation Practice		COR (95%CI)	AOR (95%CI)	P
		YES(%)	NO (%)			
Religion	Muslim	32(50)	32(50)	1.74 (0.97, 3.11)	0.61(0.39,1.03)	0.064
	Orthodox	74(48.7)	78(51.3)	1.65(1.05,2.60)*	0.66(0.34,1.29)	0.228
	Others	61(36.1)	108(64.9)	1	1	
Job category	Leader	10(27)	27(73)	2.00(0.77,5.21)	0.63(0.21,1.85)	0.397
	Expert	140(45.8)	166(54.2)	2.28(1.07,4.87)*	1.33(0.63,2.81)	0.453
	Supportive	17(42.5)	23(57.5)	1	1	
Monthly salary(ETB)	<=3000Bi	10(32.3)	21(67.7)	1.69(0.74, 3.69)	1.23(0.46,3.32)	0.681
	>3000Birr	157(44.6)	195(55.4)	1	1	
Having Willingness	Yes	147(49.8)	148(50.2)	3.38(1.95,5.80)***	2.54 (1.39,4.65)**	0.003
	No	20(22.7)	68(77.3)	1	1	
Knowledge	Knowledgeable	128(58.4)	91(41.6)	2.53(4.51,7.06)***	3.32(2.02,5.46)***	0.000
	Not Knowledgeable	39(23.8)	125(76.2)	1	1	
Attitude	Positive	127(54.3)	107(45.7)	3.23(2.07,5.04)***	1.61(0.97,2.69)	0.066
	Negative	40(26.8)	109(73.2)	1	1	
Using social Media	Yes	65(64.4)	36(35.6)	3.19(1.98, 5.12)***	1.61(0.934,2.775)	0.083
	No	102(36.2)	180(63.8)	1	1	
Listen to Mass Media	Yes	144(50.5)	141(49.5)	3.33(1.98, 5.61)***	1.83(1.01, 3.35)*	0.041
	No	23(23.5)	75(76.5)	1	1	

Significant at P<0.001=\*\*\* and P<0.05=\*, AOR=adjusted OR and CI= Confidence Interval