Original article

Status and Deterrents of Blood Donation among Civil Servants in Bahir Dar, Ethiopia

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Abstract

Background: Blood is an important ingredient in the modern public health delivery system to save the lives of many patients. However, in developing countries, due to lack of safe and reliable sources many patients requiring blood do not have timely access to it.

Objective: This study sought to identify the status and correlates of blood donation among civil servants in Bahir Dar Town.

Methods: This was a cross-sectional descriptive study conducted at Bahir Dar town. A pre-tested questionnaire was administered to 387 civil servants. The association between blood donation practice and socio demographic characteristics of respondents was tested using Chi-square. Principal Component Analysis was also used to identify the deterrents of blood donation.

Results: The majority (75.7%) of donors were males. Eighty-two percent of respondents never experienced blood donation. Among the 18 percent donors, 61 percent were replacement donors and 18.3 percent were voluntary donors. The associations between blood donation practice (P-values < 0.05) for sex and access to information (p-values < 0.01) were found statistically significant. Blood donation knowledge of participants was inadequate, but have positive attitude towards voluntary blood donation. Inconvenience and knowledge gap related factors are important deterrents for blood donation among civil servants.

Conclusion: Low levels of knowledge and inconvenience related factors are major hindrances for blood donation. Therefore, extensive awareness creation and adjusting blood collection hours and establishing mobile blood collection centers at different public sectors could encourage voluntary blood donors. [*Ethiop. J. Health Dev.* 2016; 30 (1):44-49]

Key words: blood donation; Bahir Dar; blood donation attitude; civil servants; blood donation deterrents.

Introduction

Blood transfusion is a decisive and important ingredient in managing many diseases. The demand for blood and blood products is increasing with medical technologies and health service improvements. Blood donation saves lives and improves health; however, many patients requiring blood do not have timely access to it. In low income countries, the total blood collection rates are less than 1% of the population. Unfortunately, this is below the recommendations advocated by World Health Organization (WHO) which states 3-5 % of the population should donate blood voluntarily for sustainable blood supply (1). Moreover, in developing countries where more than 80% of the world population lives nearly 60% of blood is collected from replacement or paid donors (2). Many factors affect voluntary blood donation including awareness and attitude, beliefs and traditions about blood donation and donor recruitment practices in that society (3).

There is a pressing need for blood transfusion in developing countries related with problems of complication during pregnancy and child birth, severe childhood anemia, genital blood disorders; and road traffic accidents. Severe bleeding after childbirth is the leading factor of maternal complication accounting for 75% of all maternal deaths (4).

Road traffic accidents kill 1.25 million people and injure or disable between 20 million and 50 million more a year, a large proportion of whom require transfusion during the first 24 hours of treatment; 90 percent of deaths occur in developing and transitional countries (4; 5). In Ethiopia, road traffic accident is increasing from time to time (6); it is also a serious but neglected health problem in Amhara Region (7) which increases the demand for access to safe blood.

In Ethiopia, nearly 43% of the national blood demand is collected; of which more than 60% came from schools. Low community awareness, lack of voluntary donors and limited access to public media about blood donation within the community are some of the challenges for blood donation (1).

In Bahir Dar, there is a dramatic improvement in voluntary blood donation. From the total blood collected, the share of voluntary donors was increased from15.3 % in 2012 to 93.8% in 2015 (8). However, blood donation was preponderantly dominated by students that accounted for 60%. Moreover, in 2015/16, 2.4% of the population of Bahir Dar had donated blood, which was below the minimum level set by WHO (1). Understanding of all eligible blood donors' status and deterrents are vital to improve the effectiveness of donor selection and retention.

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To the best of our knowledge, there is a dearth of research on blood donation on civil servants in Bahir Dar. Moreover, targeting on specific potential donor population helps to identify the major deterrents of blood donation among the target population. Hence, this study explored the status and deterrents of blood donation among civil servants in Bahir Dar town.

Methods
The study population and area: This study was conducted in Bahir Dar town among civil servants in June, 2015. Bahir Dar is the capital of Amhara National Regional State in north central Ethiopia. In the town, there are two hospitals and one blood bank. The blood bank collects blood from voluntary and replacement donors. Health institutions in Bahir Dar, Chagni and Motta towns are beneficiaries of the blood supply.

Study design: A cross-sectional descriptive study was employed among 387 civil servants.

Sampling and sample size determination: In Bahir Dar town there are 104 public sector establishments. Respondents were selected from sectors which have more than 50 employees. Eight sectors were selected randomly using lottery method. A proportionate sampling procedure was used to determine the number of respondents from each sector. Finally, systematic random sampling was used to identify each respondent using the payroll of each institution. When the person in the specified number was not available, the next nearest person was included in the study.

To determine the sample size, a population proportion sampling procedure was used. To get the maximum sample size proportion P=0.50 was used as there are no previous estimates on blood donation level among the study population. The researchers allowed the maximum errors to be +/-5% plus 10 % contingency. The 95% degree of confidence was used. Therefore, sample size was determined to be 422 respondents. Twenty three respondents failed to return the questionnaires while 12 questionnaires were excluded in the analysis due to substantial inconsistency in response, making the final valid cases 387.

Measurement: Structured questionnaire was used to collect data from respondents. The tool was developed after reviewing pertinent literatures (9, 10). The questionnaire was pre-tested and necessary corrections were made before collecting the final data. The data collection instrument consists of 62 items separated into three domains of knowledge, attitudes and practices.

The knowledge variables for blood donation were measured as Yes or No. A score of one was given for each Yes response and Zero for no response. Respondents with more yes responses received a higher percentage which indicated a better level of knowledge.

To determine the reliability of the questionnaire, Cronbach's alpha method was used. Alpha coefficient obtained more than 0.70; therefore, questionnaire has the necessary reliability.

Attitudes towards blood donation were measured using nine statements. To evaluate the difference among respondents' attitudes, each of them were asked whether they strongly disagree, disagreed, were undecided, agreed and strongly agreed with each statement. The responses were coded for analysis, with 1 representing the most unfriendly attitude for blood donation, 5 representing the most pro-blood donation attitudes. Composite blood donation attitudes were calculated and higher composite scores indicated that a respondent held more pro-blood donation attitude.

Blood donation experiences were assessed using statements: whether respondents have ever given blood or not. Higher frequency indicates that respondents would practice more blood donation responsive behavior.

Deterrent factors for blood donation was measured based on twenty Likert statements. To evaluate the difference among respondents' response, each of them were asked whether they strongly disagree, disagreed, were undecided, agreed and strongly agreed with each statement. Using Exploratory Factor Analysis (EFA), the correlation matrix of observed variables were used to determine which sets of variable cluster together. EFA helps to isolate constructs and concepts. "It is normally used to regroup variables into a limited set of clusters based on shared variance" (11). Therefore, EFA was used to identify latent factors that deter blood donation.

Data Collection: Data were collected by self-administered structured questionnaires.

Data Analysis: Descriptive and inferential statistics were used to analyze the data. Chi square test was used to test the association between blood donation status and socioeconomic variables.

Ethical Clearance: Respondents verbal consent was asked to participate in the study. Their anonymity remains confidential all through the study.

Results
Socio-demographic characteristics of respondents: There were 387 respondents in the age range of 20–59 years (mean age was 36.4 years). Two hundred twenty five (58%) were married while 162 (42%) were single or divorced. Two hundred seventy three (70.5%) respondents had first degree and above. Prior to the study 220 (56.8%) respondents had access to information about blood donation (Table 1).

Table 1: **Socio Demographic Characteristics of Respondents by blood Donation Status, Bahir Dar, 2015 (N=387).**

Variables	Blood Donation Status		X^2 Df P-Value
	Non Donors	**Donors**	
Sex			X^2=5.233
Female	123 (38.8)	17 (24.3)	Df=1
Male	194 (61.2)	53 (75.7)	P=0.022*
Total	**317 (100)**	**70 (100)**	
Age Group			X^2=1.329
20-29	93 (29.3)	16 (22.9)	Df=2
30-39	114 (36.0)	26 (37.1)	P=0.515
40-49	75 (23.77)	16 (22.9)	
50-59	35 (11)	12 (17.1)	
Total	**317 (100)**	**70 (100)**	
Marital Status			X^2=0.068
Single	117 (39.0)	25 (37.3)	Df=2
Married	183 (61.0)	42 (62.7)	P=0.068
Other	17 (5.4)	3 (4.3)	
Total	**317 (100)**	**70 (100)**	
Education Completed			X^2=2.868
Below First Degree	129 (40.7)	25 (35.7)	Df=2
First Degree	134 (42.3)	27 (38.6)	P=0.238
Above First Degree	54 (17.0)	28 (25.7	
Total	**317 (100)**	**70 (100)**	
Have you ever received information about blood donation			X^2=26.277
Yes	161 (50.8)	59 (84.3)	Df=1
No	156 (49.2)	11 (15.7)	P*=0.000
Total	**317 (100)**	**70 (100)**	

Significance *P<0.05

Knowledge: The mean number of yes answers to blood donation knowledge statements was 67.86 for donors and 44.14 for non-donors. Donors have in general better knowledge about blood donation than non-donors. The respondents expressed good knowledge of the common blood group types while least knowledge on the risks to be encountered during donation (Table 2). The main sources of information for blood donation were electronic media 54.3 % and health institutions 23 %, respectively.

Table 2: **Knowledge of respondents on blood donation statements (N=387)**

Items	Statements	Percentage of knowledge	
		Donors	**Non Donors**
1	Do you know how many blood types are there?	95.1	81.4
2	Do you know your blood type?	82.9	47.3
3	Do you know the age range for blood donation?	67.1	38.8
4	Dou you the weight limits for blood donation?	64.3	32.5
5	Do you know the amount of blood to be donated at a time?	60.0	28.1
6	Do you know at what frequency blood should be donated?	62.9	26.2
7	Do you know which blood type is highly demanded?	58.6	46.7
8	Can you cite three diseases to be transferred during blood donation?	65.7	54.3
9	Can you cite three risks to be encountered during donation?	51.4	42.6
10	Can you cite three conditions to be met for blood donation?	70	43.5

A multiple response analysis of reasons among donors were replacement donation 61.9 %, altruism 18.3 % and accessibility to blood collecting units 11.3 %, respectively.

Attitude: Attitude is the intention of respondents towards blood donation practice. Respondents' attitude was assessed based on items mean rank. The overall mean intention of respondents to donate blood was 3.63. The average attitude scores of donors and non-donors towards blood donation were 3.84 and 3.58, respectively. Respondents have high positive attitude towards items 1, 2, 3 and 4 (Blood Donation is a noble act; I encourage people to donate blood voluntarily; I am willing to donate blood in the future; Blood should be sold for those who needs it) with mean of 4.15, 3.84, 3.67 and 3.66, respectively. On the other hand, respondents have pessimistic attitude towards items 8 and 9 (Blood should be collected only from volunteers; Regular donors should be paid) with mean scores of 2.73 and 2.58, respectively (Table 3).

Table 3: **Participants' attitude towards blood donation (N=387)**

Items	Statements	N	Mean Rank	Std
1	Blood Donation is a noble act	387	4.15	1.133
2	I encourage people to donate blood voluntarily	387	3.84	0.887
3	I am willing to donate blood in the future	387	3.67	1.037
4	Blood should be sold for those who needs it	387	3.66	1.160
5	Only the strongest should donate	387	3.45	1.129
6	Relatives of patients should be asked to donate blood	387	3.32	1.223
7	I intend to donate blood regularly	387	3.16	1.051
8	Blood should be collected only from volunteers	387	2.73	1.306
9	Regular donors should be paid	387	2.58	1.247

Majority of respondents 274 (70.8%) had positive intention (>3 on the five point Likert Scale) to donate blood regularly. Almost 75% of the respondents have intention to encourage others to donate blood voluntarily; but only 18% of them had blood donation experience.

Blood Donation Experience: Seventy (18.1%) of respondents experienced blood donation; of which, 74.3% (52 of 70) were males. The maximum donation was 3 times, however, 64% (45 of 70) of respondents donated only once. In spite of large number of eligible population for donation, only a small proportion had donated blood.

A chi square test was performed to see whether there is an association between blood donation status and various socio-demographic characteristics (sex, age, marital status, education and access to information). It was found that only sex X^2(1, N=70)=5.23,P<0.05) and access to information X^2(1,N=70)=26.277,P<0.001) have statistically significance difference with blood donation status. With regard to sex this result is consistent with the findings in Iran (12).

Factor Analysis Result: A principal component analysis (PCA) was conducted on 20 items that are believed to deter blood donation decision with orthogonal rotation (Virmax) using SPSS version 21. Prior to performing PCA, the suitability of data for factor analysis was assessed. Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO=.72 "Good" according to Field 2009

and KMO values for individual items were >.52, which is well above the acceptable limit of .5 (13). Bartlett's test of sphericity X^2 (55) =892,329, P<.001, indicate that correlations between items were sufficiently large for PCA.

An initial analysis was run to obtain eigen values for each component in the data. Four components had eigen values over Kaiser's criterion of 1 and in combination explained 67.97% of the variance. However, the scree plot was slightly ambiguous and showed inflection that would justify retaining only up to 3rd component. This was further supported by the result of Parallel Analysis, which showed only three components with eigen values exceeding the corresponding criterion values for randomly generated data matrix of the same size 20 variables x 317 respondent (14). The three-component solutions explained a total of 58.1% of the variance; with component 1, 2 and 3 contributing 29.7%, 15% and13.4 %, respectively. Table 4 shows factor loadings after rotation using a significant criterion of 0.4. Varimax rotation was used to rearrange the pattern matrix from largest to smallest loading for each factor which makes interpretation easy. Accordingly, five items were complex variables and four variables were removed from the final analysis as they were not significant in the model.

The items that cluster on the same components suggest that component 1 represents inconvenience, component 2 knowledge related and component 3 fear related (Table 4).

Table 4: **Summary of Exploratory Factor Analysis results for the Deterrents for blood donation (N=317)**

Item	Rotated Factor Loadings		
	Inconvenience	Knowledge	Fear
Lack of time to donate blood	0.812		
Inaccessibility of blood collection center	0.806		
Waiting time	0.725		
Practical skills of employees	0.688		
I do not know where to donate blood		0.785	
I am not asked to donate blood		0.772	
I do not know the importance of blood donation		0.689	
I am afraid fainting			0.898
I afraid pain			0.894
Eigen values	2.47	1.81	1.65
% of Variance	22.44	16.48	15.03

Discussion

A cross-sectional study was conducted in Bahir Dar, Ethiopia, on 387 civil servants to assess their status and deterrents of blood donation. Knowledge of blood donation may influence the perception and awareness about voluntary blood donation. It seems an important means to construct positive attitude and minimize fear of blood donation.

More the than 60% of respondents were male, which is consistent with (85.4%) a study conducted in India (15). The mean age of respondents was 36.4 years, which is higher (31.65 years) than a study conducted in Mekele town (16).

The mean correct blood donation knowledge of respondents is 56 and have positive attitude towards blood donation, however, only 18.1% had blood donation experience. A study conducted on Healthcare Workers at the University of Benin, Nigeria showed that the majority of participants had good knowledge and positive attitude towards donation; but only less than a quarter of respondents have blood donation experience which is consistent with the findings of our study (17).

Among respondents who had blood donation experience 64% had donated only once; whereas a study in Iran found that 54.9% were repeated donors (18). Bahir Dar Blood Bank should design strategies to increase and retain voluntary donors and transform first-time donors into repeaters.

The major source of information for blood donor was electronic media which account for 54.3%. This is consistent with previous studies conducted in Mekele town (16) and in India (19).

In this study, 61% and 18.3% of the donors were replacement and voluntary respectively. Previous studies indicate different findings for replacement and voluntary blood donations. In Iran, Leila Kasraian pointed out that 70.3 % and 1.8% were an altruism and replacement donor respectively (18), which is contrary to our finding. A study in Mekele town (16) showed 10 % and 2% replacement and voluntary donors respectively. But a study conducted in India showed almost equal number of replacement (51%) and voluntary (49%) donors (19). In our study, blood is obtained either from replacement or voluntary donors. In contrast to this finding, a study in Lithuania found that 89.9 % blood was collected from paid donors (20).

The overall level of respondents' blood donation knowledge was 56%. This is better than the findings among Ambo University students (40.1%) (21), but consistent with the findings in Maharashtra, India (22). Another study conducted on black employees of University of Limpopo, South Africa, found overall 50.7% knowledge of participants on blood (23) which is consistent with the findings of our study. A study in India (24) found surprisingly different result, 98% of participants had blood donation knowledge which is inconsistent with our findings.

The percentage (18.1) of blood donors is better than a study conducted in Mekele town (12.4%) (16). Civil servants are reasonably informed and have positive perception towards blood donation; however, only few of them have donated blood. Inconvenience related factors are the major hindrances (24.45%) for blood donation, which is consistent (21%) with a study conducted in India (25). Another study in Iran prioritized non-consideration and forgetfulness as the most important reasons for not to donate blood which is different from our finding (3).

The samples were only civil servants, so the validity of the findings to the whole population of the town is unknown. If all the eligible population of the town were represented in this study, it could reflect level of blood donation status of the total population of the town. Our results would seem to demonstrate participants' low level of knowledge and positive intention to blood donation with inconvenience and knowledge related factors as the main deterrents of donation.

Conclusion:

The present study was designed to assess the status and deterrents of blood donation among civil servants in Bahir Dar town. Participants have positive blood donation attitudes, but low blood donation knowledge (10). Only 18.1% of participants have blood donation history. More than 60 % of donors had donated blood for replacement purpose. These findings also revealed that donors had donated blood lately with mean age 36.4 years. Inconvenience related factors are important deterrents of blood donation. Adjusting blood collection hours and establishing temporary blood collection centers at different public sectors and public meeting places could encourage voluntary blood donors.

Though the participants showed verbal commitment for pro-blood donation intention, their inadequate knowledge might restrict their participation to donate blood. High level of knowledge towards voluntary blood donation might result in a high tendency to participate in voluntary blood donation. Therefore, awareness creation among civil servants may raise their level of knowledge on voluntary blood donation.

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