

# Cross-Sectional Study on Knowledge, Attitude and Practice of Voluntary Blood Donation among Nursing Staff at Orotta National Referral Teaching Hospital Asmara, Eritrea

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## Abstract

**Introduction:** Blood transfusion is one of the essential components of quality health care service package. Safe blood for transfusion is obtained mainly from Voluntary blood donors that are considered as safe contributors of blood and blood components. even though the level of knowledge, attitude and beliefs regarding blood donation affects the number of potential voluntary blood donors, in emergency situations the availability and accessibility of safe blood and blood products is crucial; **Objective:** The aim of this study was to assess the knowledge, attitude and practice towards voluntary blood donation among nursing staff and to determine the association between blood donation, and gender, age and educational or professional level of nursing staff. **Methodology:** A cross-sectional study on knowledge, attitude, and practice of voluntary blood donation among nursing staff was conducted at Orotta National Referral and Teaching Hospital (ONRTH), Asmara, Eritrea. In this study a total of 142 nursing staff were recruited. A structured questionnaire was applied to collect information. Data was cleaned, coded, entered and analyzed using SPSS version 22. **Results:** The study included a total of 142 nursing staff that had three professional levels. Majority (67.6%) of the study participants were females with a Mean age of 26.99 years (SD ±6.643). About 78% and 94% were Orthodox by religion and Tigigna ethnic group, respectively. Majority (100%, 93.7%) of the study participant had good knowledge on blood groups/types and their blood group and Rh. Almost 99 % and 75% had awareness on age group permitted to donate blood and blood donation interval of 3 months. The study results revealed an average knowledge on blood donation of people with chronic non – communicable diseases but good knowledge on the harmfulness and unsafely of blood drawing from people with communicable diseases mainly Hepatitis (97.9%) and HIV/AIDs (99.3%). Around 92% and 56 % of the study participants responded that pregnant and lactating women cannot donate blood. Nearly Sixty five percent of the respondents noted that blood drawing at once/single time should not exceed 500ml and either within the time interval of less or 20 minutes (36.6%), or 20 minutes to 1 hour (35.2%). Majority(94.4%) of the respondents agreed that blood donation as good and voluntary donors as the best (90.1%) where as 78.2% mentioned also patients relatives blood donation as a replacement donation. Temporary weakness (77.5%) was as the main complication that can happen during and after blood donation. Around half (55 %) of the nursing staff have never donated blood and the main reason for not donating blood was underweight (57%). About 68 % of those who donated blood 44.4% were voluntarily blood donors less than once(93.7%) in a year. The study revealed a significant association between blood donation and male gender ( $P$ -value = 0.001), but age ( $P$ -value= 0.384) and nursing staff educational or professional level ( $P$ -value= 0.721) were found to have no significant association. **Discussion and conclusion:** The study results revealed a good knowledge and attitude towards blood donation. But the level of practice in donating blood was found to be very low. Significant association between male gender and blood donation was found. But age and educational or professional level were found to have no significant association with blood donation. Therefore, the study recommends to Ministry of Health, higher teaching institutions (medical school and college of health sciences) and the national blood bank to design policies and strategies that promote and motivate students and health service staff members in donating blood and pivoting the communities towards voluntary blood donation.

**Keywords:** Hydatid cyst, Lung, Pregnancy.

## INTRODUCTION

Safe blood transfusion is one of the essential components of quality health care service package. The amount of blood that is used for transfusion is collected from healthy individuals in the age range of 18 – 60 years. Voluntary blood donors are the main contributor of safe blood to be transfused. Sufficient and safe blood donation/transfusion service is an essential component of health care system of a nation. Those who are selected for blood donation should be from a group of population with low risk of infection and prevalence of infectious diseases.

In the low-income developing countries malaria, multiparity, pregnancy and delivery, traffic accidents and injuries increase the magnitude of the demand for blood transfusion needs. In most of the developing world especially Sub-Saharan countries the largest amount of blood is transfused to children and mothers.

According to World Health Organization (WHO), survey Report (2010), out of the 46 countries of the WHO African Region, in 2010 forty-three countries had collected a total of 3, 486, 192 units of blood that ranged from 942 units (Equatorial Guinea, population =700 401) to 789 units (South Africa, population number = 50, 132, 817) [1].

As a result of the advancement in clinical sciences, population increase and rise in traffic accidents, the need for blood donation and transfusion is growing. Blood donation is one of the genuine human acts that help in saving lives, because blood is an essential element of human life without an ideal substitute. According to WHO (2013), the average blood donation rate in the African region was 4.7 units/1000 inhabitants ranging from 0.7/1000 in Nigeria to 39.7/1000 in Mauritius [2].

In developing countries although many individuals are aware about blood donation and are eligible to donate blood only a small percentage of eligible individuals donate blood [2]. In most developing countries hesitation for blood donation is attributed to misconceptions related to fear of physical harm during donation [3, 4].

World Health Organization advocates for 100 percent of non-remunerated voluntary blood donation (VBD), which is considered as the first line defense against transmission of diseases. In the African region still the average percentage of voluntary non-remunerated blood donors (VNRBD) is 67.0%. But in South Sudan it ranges from 2.3% to 100% [2]. In Eritrea in 2010, blood donation rate was 2.8 units / 1000 population and 88 % were voluntary donors, whereas in 2013 it was observed to be lowered to 1.4 units /1000 population for blood donation rate and 92.5% voluntary donors [1, 2].

Blood donation is one of the most important practices for saving life and maintaining health of individuals. This is usually promoted by creating awareness among health professionals and proper community health education and sensitization. A cross sectional study that was conducted in three medical colleges of Karachi (2014), documented 92% of appropriate knowledge regarding blood donation with 50% willingness of donating blood among the students [5]. Reports from a cross-sectional study on knowledge, misconceptions and motivations towards blood donation among university students that was conducted in Saudi Arabia (2013), indicated 81% of the study participants as non-donors and those who were donors had an experience of 13%, 5% and 1%, donation of blood for once, twice and regularly, respectively. The study also mentioned

friends (53%) and television (TV) (24%) as the most common channels or sources of information for the study participants regarding blood donation [6].

A study on the assessment of knowledge, attitude and practice of voluntary blood donation among healthcare workers that was conducted in Nigeria (2013), documented a good knowledge with positive attitude towards voluntary blood donation but poor practice of voluntary blood donation. The study reported 22.1% of blood donation among health workers of whom only 41.7% were voluntarily. The study showed a strong disparity between the knowledge, attitude, and practice of voluntary donation amongst healthcare workers [3].

In East African countries there are many studies on voluntary blood donation. A study on knowledge, attitudes, practices, and associated factors with voluntary blood donation among university students in Tanzania (2016), revealed 93% of positive attitude and 88 percent of willingness to blood donation. The study also showed a significant association between ever donating blood, and male gender, knowing a person who donated blood, willingness to donate, the amount of blood to be donated, and not expecting reward after donation [7]. According Ahmed (2017), a study on knowledge, attitude, practice and associated factors of voluntary blood donation among undergraduate students in Hargeisa university also reported inadequate knowledge (46.6%) and favorable attitude (46.9%). The study also indicated a significant association between blood donation, and age and male gender [8].

A study in Ethiopia, by Teklu (2015), reported a good knowledge on blood donation in 54.2% among health workers [9]. Another community based cross-sectional study in Ethiopia (2016), also revealed an adequate knowledge, good attitude and experience of blood donation as 56.8%, 82% and 18.4%, respectively. The study also found a significant association between adequate knowledge towards blood donation, and increased level of education, age, self-perceived health status and religion [10]. A study on knowledge, attitude and practice towards blood donation and associated factors among adults in Northwest Ethiopia (2016), documented 56.5 % and 52.2 % of knowledge and favorable attitude on blood donation, respectively [11].

### Study objectives

The aim of this study was to assess the knowledge, attitude and practice towards voluntary blood donation among nursing staff and to determine the association between blood donation, and gender, age, and educational or professional level of nursing staff.

## METHODOLOGY

### Study design and Study area

A cross-sectional quantitative descriptive study was conducted at Orotta National Referral and Teaching Hospital (ONRTH), located in the capital city, Asmara, Eritrea.

### Study participants

The study participants were Nurses with Bachelor's Degree (BSc.N), Diploma Nurses and Associate Nurses with certificate.

### Sample selection and sample size

First, nursing staff were listed according to their professional/educational level by stratifying in to three categories. Secondly, a systematic random sampling was applied for each professional category for the purpose of inclusion 50% of the source population.

### Data collection and analysis

Data was collected by the research team using a structured questionnaire through face-to-face interview. Data was analyzed using descriptive statistics like frequency, percentage, mean, standard deviation and association of the variables was tested through Chi-square test. Data editing was performed on site immediately after data collection for checking accuracy,

consistency and missed values. The collected data was entered in to excel software which was later exported to SPSS version 22 for data cleaning and analysis.

## RESULTS

### Socio-demographic characteristics of study participants

The study included a total of 142 nursing staff with three different levels of nursing professions out of which 6 (4.2%) nurses with Bachelor's Degree (BSc.N), 66 (46.5 %) midwife nurses (Nurses with Diploma) and 70 (49.3%) associate nurses (certificate). Majority (67.6%) of the study participants were females, and the age range was between 21–60years with a mean age of 27 years (SD ±6.6). Almost 78 % of the study participants were Orthodox by religion and from Tigrigna ethnic group (93.7%) (Table 1).

**Table 1:** Socio-demographic characteristics of study participants (N=142)

Variable	Number (N)	Percent (%)
<b>Gender</b>		
Male	46	32.4
Female	96	67.6
<b>Age</b>		
20 – 29 Years	115	81.0
30 – 39 Years	20	14.1
≥ 40 Years	7	4.9
<b>Religion</b>		
Orthodox	113	79.6
Muslim	11	7.7
Catholic	10	7.0
Protestant	8	5.6
<b>Ethnic group</b>		
Tigrigna	133	93.7
Tigre	6	4.2
Hidareb	2	1.4
Saho	1	0.7
<b>Marital status</b>		
Married	16	11.3
Widowed	2	1.4
Living Together	1	0.7
Single	123	86.6
<b>Educational or Professional level</b>		
Associate Nurse (12+1)	70	49.3
Midwife Nurse (12 +3)	66	46.5
Nurses with Bachelor's Degree (12+4)	6	4.2

### Knowledge on blood donation

All (100%) participants of the study were found to be familiar with the types of blood group but 6.3% of the study participants didn't

knew their blood group or Rh. Almost all (99.3%) and 74.6% of nursing staff were aware of the age group permitted to donate blood and blood donation interval of 3 months, respectively (Table 2).

**Table 2:** Knowledge on blood donation (N=142)

Variable	N (%)
<b>Knowledge on blood groups or types</b>	
Yes	142(100%)
<b>Number of nursing staff who know their blood group or type</b>	
yes	133(93.7%)
No	9.0 (6.3%)
<b>Blood group of the respondent</b>	
A	27 (19.0%)
B	37 (26.1%)
AB	11 (7.7%)
O	58 (40.8)
Don't know their blood group	9.0 (6.3%)
<b>Rh of the respondent</b>	
Rh <sup>+</sup> ve (Rh Positive)	127 (89.4%)
Rh <sup>-</sup> ve (Rh Negative)	6.0 (4.2%)
Don't know their RH group	9.0 (6.3%)
<b>How often can an individual donate for a blood</b>	
Monthly	9.0 (6.3%)
Every Three Months	106 (74.6%)
Every Six Months and above	17 (12.0%)
I don't Know	10 (7.0%)
<b>Who Should donate blood</b>	
Men and Women	140 (98.6%)
I don't Know	2.0 (1.4%)
<b>The optimum age for blood transfusion</b>	
≤ 18 years	1.0 (0.7%)
18 – 60 years	141 (99.3%)

Out of all the respondents 54.2%, 51.4%, 59.2% and 90.8% mentioned that blood donation from patients with diabetes, hypertension, mental illness and disability (non – communicable diseases) as bad or harmful procedure to the donors. Majority (97.9% and 99.3%) of the study participants also mentioned that blood donation from donors with hepatitis and HIV/AIDs (communicable diseases) as insalubrious procedure and unsafe. Thirteen percent of the respondents were not able to identify the minimum weight of a person who should donate blood. Around 92% and 56% of the study participants responded that a pregnant and lactating woman cannot donate blood, respectively, whereas the remaining 4.2% and 19.0% reported that they don't have an idea on it. Almost sixty five percent of the respondents noted the maximum volume of blood drawing at once/single time should not exceed 500ml, whereas 23.9% and 4.9% replied that 500 – 1000ml and greater than 1000ml. and nine (6.3%) acknowledged their lack of knowledge by stating "I do not know". As to the duration or interval of blood donation the results showed equal response (36.6% and 35.2%) for less or equal to 20 minutes and between 20 minutes to 1 hour, whereas 28.2%acknowledged their lack of knowledge by stating "I don't know". (Table 3).

**Table 3:** Knowledge on blood donation regarding to diseases (N=142)

Variable	N (%)
<b>Does patients with such diseases donate blood</b>	
<b>Diabetes</b>	
Yes	65 (45.8%)
No	77 (54.2%)
<b>Hepatitis</b>	
Yes	3.0 (2.1%)
No	139(97.9%)
<b>Hypertension</b>	
Yes	69 (48.6%)
No	73 (51.4%)
<b>HIV/AIDs</b>	
Yes	1.0 (0.7%)
No	141 (99.3%)
<b>Disability</b>	
Yes	13 (9.2%)
No	129 (90.8%)
<b>Mental Illness</b>	
Yes	58 (40.8%)
No	84 (59.2%)
<b>Weight range for safe blood donation</b>	
< 50	19 (13.4%)
50 - 60	122 (85.9%)
≥ 60	1.0 (0.7%)
<b>Can a pregnant women donate blood</b>	
Yes	5.0 (3.5%)
No	131(92.3%)
I don't Know	6.0(4.2%)
<b>Can a lactating women donate blood</b>	
Yes	35 (24.6%)
No	80 (56.3%)
I don't Know I don't Know	27 (19.0%)
<b>What is the amount of blood is collected at a single time</b>	
≤ 500 ml	92 (64.8%)
500 – 1000ml	34 (23.9%)
≥ 1000ml	7.0(4.9%)
I don't know	9.0 (6.3%)
<b>What is the duration of donation process</b>	
≤ 20 minutes	52 (36.6%)
20 minutes – 1 hour	50 (35.2%)
I don't know	40 (28.2%)

### Attitude towards blood donation

Out of the 142 study participants 134 (94.4%) responded that blood donation as good and 90.1% presented voluntary donors as the best. The study results showed a response of 45.1%, 52.8% and 2.1%, as yes, no and I don't know for the harm fullness of blood donation. Majority (77.5%) indicated temporary weakness as the main complication that can happen during and after blood donation. Around 78 % indicated that patients' relatives blood donation is best if it is considered as a replacement donation (Table 4).

**Table 4:** Attitude of study participants towards blood donation (N=142)

Variable	N (%)
<b>What do you think about blood donation</b>	
Good	134 (94.4%)
Neutral	8.0 (5.6%)
<b>Who do you think that the best source of blood</b>	
Voluntary donor	128 (90.1%)
Replacement donor	1.0 (0.7%)
Auto transfusion	8.0 (5.6%)
I don't know	5.0 (3.5%)
<b>Can something harmful happen to a blood donor during or after donation</b>	
Yes	64 (45.1%)
No	75 (52.8%)
I don't know	3.0 (2.1%)
<b>What can happen a blood donor during or after donation</b>	
Contract infection	2.0 (1.4%)
Temporary weakness	110 (77.5%)
Fall sick	11 (7.7%)
I don't know	19 (13.4%)
<b>Patients' relatives should be asked to donate blood</b>	
Yes	111 (78.2%)
No	29 (20.4%)
I don't know	2.0 (1.4%)

### Practice of blood donation

Seventy-nine (55.6%) of the study participants have never donated blood and the main reason for not donating blood was underweight (57.0%). Majority (93.7%) of those who donated blood (44.4%) were voluntarily blood donors, but 68.3% had an experience of less than once a year. 83.1% of the study participants showed their preparedness for blood donation whenever they are reminded or called upon for blood donation (Table 5).

**Table 5:** Practice of study participants towards Blood Donation(N=142)

Variable	N (%)
<b>Have you ever donated blood before</b>	
Yes	63 (44.4%)
No	79 (55.6%)
<b>If you didn't donate what was the reason</b>	
Health problem	7.0 (8.9%)
Fear	10 (12.7%)
Under weight	45 (57.0%)
No reason	17 (21.5.0%)
<b>If you donated how often was it</b>	
≤ one time a year	43(68.3%)
One to three times a year	13 (20.6%)
More than three times a year	7.0(11.1%)
<b>Why do you donate blood</b>	
For a friend or relative	4.0 (6.3%)
Voluntary	59 (93.7%)
<b>If you called upon or reminded to do so, do you donate blood</b>	
Yes	118(83.1%)
No	14 (9.9%)
I don't know	10(7.0%)

### Association between blood donation and, gender and professional staff category

The study showed a significant association between male gender and blood donation ( $P$ -value = 0.001), but age and nursing staff educational or professional level were found to have no significant association with blood donation at  $P$ -value= 0.384 and  $P$ -value= 0.721, respectively (table 6).

**Table 6:** Association between blood donation and, gender and staff category (N= 142)

Variable	Donors N (%)	Non donors N (%)	$\chi^2$	$P$ - Value
<b>Gender</b>				
Male	30 (65.2%)	16 (34.8%)	11.985	0.001
Female	33 (34.4%)	63 (65.6%)		
<b>Age</b>				
20 - 29	49 (42.6%)	66 (57.4%)	0.757	0.384
≥ 30	14 (51.9%)	13 (48.1%)		
<b>Educational/ professional Level</b>				
Associate Nurses (12+1)	30 (42.9%)	40 (57.1%)	0.127	0.721
Diploma Nursing and BSc.N(≥12 +3)	33 (45.8%)	39 (54.2%)		

## DISCUSSION

The study included a total of 142 nursing staff that has three educational and professional levels of which 67.6% were females. The age range was 21–60 years with a mean age of 26.99 years (SD ± 6.643). The study participants were mainly from the Tigrigna ethnic group (93.7%) and Orthodox (79.6%) by religion.

This study results showed 100% knowledge on being familiar with the blood group classification/type, whereas 6.3% were found without knowledge either on their blood group and Rh. This study results are better than the study results in Ethiopia (2015 and 2018), that documented 97.6% and 96.3% good knowledge of the common blood group types and 84.1% knowledge of their own blood group and Rh [9, 12]. The good knowledge on the blood group classification/type can be argued that they are health professionals who are working in the hospital but the lack of knowing their blood group may be interlinked to the non-donating behaviors of these health professionals. 99.3% of the nursing staffs were aware of the age group permitted to donate blood. This study results were found in line to a study in India (2015), that showed 90 % and 48.9% of knowledge about the recommended age and interval of blood donation [13]; but it was found to be inconsistent with results of a study in India (2012 and 2013) that was conducted for the assessment of awareness on blood donation among medical students (MBBS) and among the nursing staff that reported a prevalence of 43.2% and 43.18% lack to awareness of the age groups who are legitimate for blood donation [14, 15]. The study also indicated 38.63% lack of knowledge and 29.54% lack of awareness regarding to the minimum weight required for blood donation and blood donation interval of 3 months, which are inline to this study results that showed 14.1% lack of knowledge about the optimum weight required for blood donation but 74.6% of awareness regarding to blood donation interval of 3 months [15]. Majority of the study participants had a good knowledge on blood donation regarding to the people with communicable diseases (Hepatitis and HIV/AIDs) but less knowledge for those with non-communicable diseases that include mainly diabetes, hypertension, mental illness and disability.

Most (94.4%) of the study participants revealed blood donation as good and 90.1% acknowledged voluntary blood donation as the best. 52.8% of the study participants agreed that blood donation as a non-harmful procedure which is consistent to the study among health professionals, university of Gondar Hospital, Ethiopia (2017), that documented a response of 56.3% as a comfortable or positive feeling after donating blood [16]. The study results showed a response of 45.1%, 52.8% and 2.1%, as yes, no and I don't know for the harmfulness of blood donation. Majority (77.5%) indicated temporary weakness as the main complication that can happen either during or after blood donation. 78.2% of the nursing staffs supported relatives blood donation as a replacement.

Seventy-nine (55.6%) of the nursing staff have not donated blood at all and the main reason for not donating blood was underweight (57.0%). Majority (68.3%) of those who donated blood 44.4% were voluntarily blood donors, but 93.7% had an experience of less than once a year. 83.1% of the study participants showed their preparedness for blood donation whenever they are reminded or called upon for blood donation. Even though the response of blood donation (44.4%) is better than a study on community assessment of knowledge, attitude and practice on blood donation in South West, Ethiopia (2015), that documented a good knowledge (76%) and positive attitude (93.8%), and only 26.4% of blood donation in their life; it is

considered to be insufficient because the study participants are health professional [17].

The study results showed a significant association between male gender and blood donation ( $P$ -value = 0.001). These results are in line to a previous study that was conducted in Karachi (2014) and Ethiopia (2017) among undergraduate medical students, Ethiopia (2015) among health workers in Tikur Anbessa hospital and health workers in health facilities (2015), and Tanzania (2016) among university students, showed a significant association between knowledge on blood donation and male gender which in turn affects blood donation behavior [5, 7, 8, 9, 18]; But age ( $P$ -value = 0.384) and nursing staff educational or professional level ( $P$ -value = 0.721) were found to have no significant association with blood donation.

## CONCLUSION

The study results revealed a good knowledge and attitude towards blood donation; but the level of practice in donating blood was found to be very low. The study results also showed a significant association between male gender and blood donation. But age and nursing staff educational or professional level were found to have no significant association with blood donation. Therefore, the study recommends to Ministry of Health, higher teaching institutions (Medical School and College of Health Sciences) and the National Blood Bank to design policies and strategies that promote and motivate students and health service staff members in donating blood and pivoting the communities towards voluntary blood donation.

### Ethics approval and consent to participate

Ethical approval was obtained from the ministry of Health, Ethical and Research Committee and consent of participation was obtained from the study participants.

### Consent for publication

All participants gave an oral and/or written consent for their information to be used in this manuscript

### Availability for data and material

The data that support the findings of this study are available with the authors and can be provided upon reasonable request.

### Conflict of interest

The authors declare that there is no conflict of interest

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### Abbreviations:

AIDs	Acquired Immunodeficiency Diseases Syndromes
BSc.N	Bachelor's in the Science of Nursing
HIV	Human Immunodeficiency Virus
MBBS	Bachelor of Medicine, Bachelor of Surgery,

ONRTH	Orotta National Referral and Teaching Hospital
Rh	Rhesus factor
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences
TV	Television
VBD	Voluntary Blood Donation
VNRBD	Voluntary Non Remunerated Blood Donors
WHO	World Health Organization,

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