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**Original Research Article**

# BLOOD DONATION PRACTICE AND ASSOCIATED FACTORS AMONG HEALTHCARE WORKERS IN PUBLIC HEALTH FACILITY OF DESSIE TOWN, NORTH EAST ETHIOPIA, 2016.

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**Abstract**

**Introduction:** Even though blood donation is life saving practice, in Ethiopia current blood supply is far less compared to the demand and it is based on family based blood donation which disfavor most critical patients. So that, ensuring adequate blood supply would be vital for the patient as well as health care system.

**Objective**: To assess blood donation practice and associated factors among healthcare workers in public health facility of Dessie town, North East Ethiopia.

**Methods:** Institutional based cross sectional study in 270 health workers with systematic random sampling method by using self administers questions. Bivariate and multivariate logistic regression were use to identify significant predictor factors for blood donation practice and presented with AOR and P value.

**Result:** Out of 270 sample health professionals, 86(31.9%) and 47(53.4%) had ever donated blood in their life time and the last one year period respectively. Of those ever donors, 24(27.9%) were donate one time in their life and the main reason for donation was voluntary (53.4%). Similarly, the main reason for not donation was fear of side effect or discomfort after donation (64.13%).

Knowing once blood group type [AOR: 5.03(1.814-3.95)], knowing the amount of blood volume at each donation [AOR: 1.83; (1.27-3.472)], know the minimum weight to donate blood [AOR: 2.0; (1.052-3.813)] and Time spent for blood donation were positively statically significant variables for ever blood donation practice.

**Conclusion and Recommendation:** There is low level of blood donation practice as compared to its lifesaving importance and national demand. So the ministry of health or other responsible organizations should work on changing knowledge and attitude of health professionals since they should be a role model for the community.

**Key Words: Blood Donation, Life Saving Practice, Health Care Workers**

## Introduction

Blood donation is an important life saving gift that cannot be manufactured and an individual gives a unique and precious resource(1). Blood transfusion contributes to saving millions of lives each year and improving the life expectancy and quality of life of patients suffering from life-threatening conditions (2). Melbourne, Australia declaration in 2009 states that Voluntary Non-Remunerated Donation of Blood and Blood Components to every patient as need should be available in each health facility(3,4). However, still many patients die or suffer unnecessarily specifically in underdeveloped countries because they do not have access to safe blood transfusion. The timely availability of safe blood and blood products is essential in all health facilities in which transfusion is performed, but in many developing and transitional countries there is a widespread shortfall between blood requirements and blood supplies(1)

WHO 2011 fact report shows that, globally around 92 million blood donations are collected annually from all types of blood donors including voluntary unpaid, family/replacement and paid). Approximately half of these blood donations are collected in high-income countries (48%) and Africa accounts only 4.3 % global donations (1,5,6). In recent year WHO 2015 report shows that, there is an improvements in blood donation that makes around 108 million units of donated blood are collected globally every year but still donation practice were low in developing counties in which 50% of donated blood came from high income countries(7).

According to WHO indicators of availability of blood in a given country determine by whole blood donations per 1 000 population, high-income countries accounts 36.4 donations/1 000 population whereas low income countries, 2.8 (range 0.4 – 8.2) donations per 1 000 population. Specifically Ethiopia accounts less than 5 donations per 1000 population(5).

In Ethiopia annually 80,000-120,000 units blood required (4) and of which 42,000(43%) units of blood collocated and distributed to health facility (8). Of which 59% blood came from relatives or friends (9). This shows that there is an improvement in blood donation since previously 70% donations were depending up on family and friends (10).

Despite, the country has an ever growing high demand of safe blood for life-threatening emergencies, less than 1% the population participates in blood donation and of which 70% of annual blood collected and utilized in Addis Ababa, capital city of Ethiopia(1). Ethiopia is among one of the highest maternal and child mortality countries. A significant portion of the population death was attributed by traffic accident injury and trauma (8,11).

Though the blood donation is life saving practice, Ethiopia's current blood supply is far less compared to the demand. Ensuring adequate blood supply would be vital for the health care system. Healthcare institutions and its workers are expected to be more aware than the general population, should take the lead to create awareness on blood donations among the population.

**Objective:**

To assess the blood donation practice and associated factors among healthcare workers in public health facility of Dessie town, North East Ethiopia, 2016

## Methods

### Study design and period

Institutional based cross-sectional study design was conducted in June 2016.

### Study area

The study was carried out in Dessie town public health facility workers. Dessie Town is one of the oldest town which is located

in South East of Amhara Region 523 km from Bahir Dar (Regional state capital) and 401Km from Addis Ababa(National Capital City) and by itself the capital city of South Wollo zone.

Based on health profile of Dessie City Administrative health office, the town has eight health centre with 10 health posts, one district and one zonal referral government hospitals and 3 private general hospitals and 3 specialized junior clinics, 5 private medium clinics, 2 NGO medium clinics, 15 private junior clinics, (For profit and Non profit), pharmacies and drug stores which deliver routine preventive and curative health services to the community.

**Source population**: All healthcare workers in Dessie public health facility.

**Study population:** All healthcare workers in Dessie public health facility and available at the time of data collection.

**Inclusion criteria**

All health care workers in Dessie public health facility (who are diploma and above level).

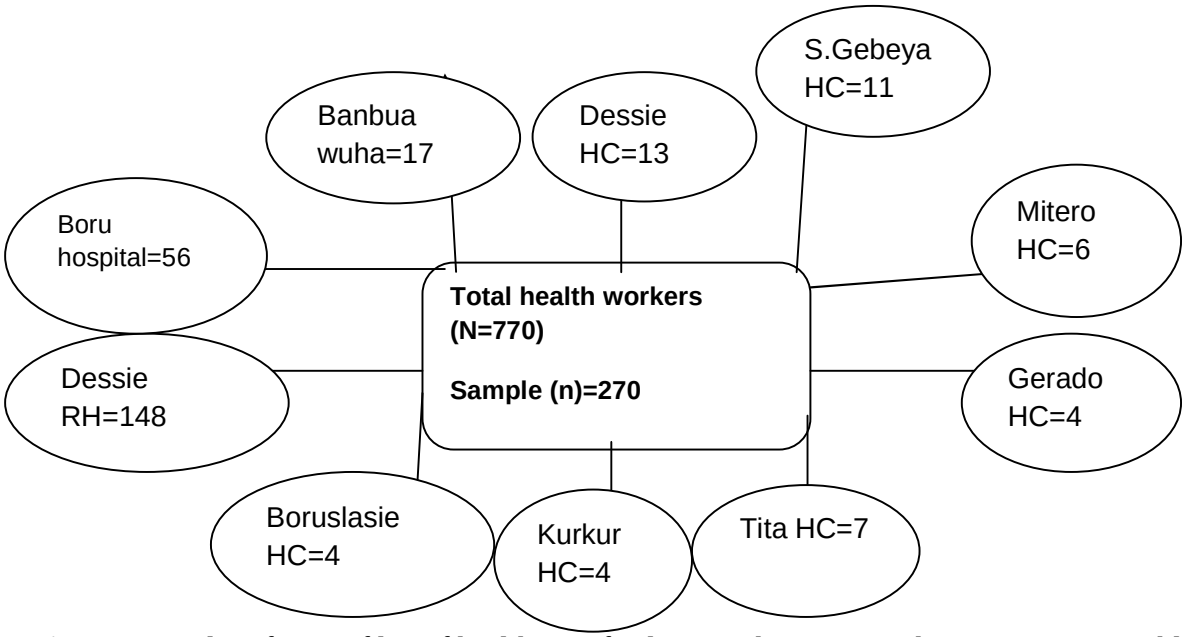
**Exclusion criteria:** Health care workers who were working in emergency service with busy schedule

**Sample size determination**

The required sample size was determined using EpiInfo statical software version 7.2, single population proportion formula by taking proportion ever blood donation practice 32.6%(21) and 95% level of confidence with 5% marginal error. Out of770 total number of diploma and above staffs the sample is 235. With 15% of non response rate, the final sample size was 270.

**Sampling procedure**

In each health facility in which study was conducted, separate sampling frame had made (list of health professionals established). Then proportional to their size, sample healthcare workers was selected using systematic random sampling method. First, K value was identified for each healthcare facility (Ki=Ni/ni) and then random sample was determined by using lottery method. And finally representative sample workers were selected in every k interval.




**Figur1**: Sampling frame of list of health care facilities with respect to their size, Dessie public health facility workers, June 2016.

**Dependent Variable:** Blood donation practice (yes or not)

**Independent variables**

1).Socio-demographic and economic characteristics: residence, ethnicity, sex, age, religion, marital status, educational status, occupation, family size and monthly income.

2).Knowledge on blood donation related variables

3).Attitude of blood donation practice related variables

4).Health professional medical condition related variables.

**Data collection procedure and data quality control**

Data collection by using structured self administered questionnaire after taking consent from study subjects

The questionnaire first prepared in English and translated into Amharic (local language) and retranslated back to English to check for consistency.

The data was collected by five certificate community health workers for five working days.

To insure the quality of the data, one day training had given to data collectors on the objective of the study, the questionnaire and extent of explanations and the way of keeping the privacy and confidentiality of the study subjects.

Pre-testing of questionnaire was conducted other than the study area in order to assess clarity and consistency of the questionnaire then adjustment was made. Inspection for completeness of questionnaire was carried out by principal investigators during the field work as supervision.

**Data processing and analysis**

The collected data was cleaned and entered to Epi Data 3.1 software which secured further data quality by reducing errors made while data entry. Then, entered data was transported to SPSS version 21.0 for data analysis.

To explain the study population in relation to relevant variables, descriptive statistics were computed like a frequency distribution table; graph and summery measures were computed.

To identify significantly associated variables for blood donation practice, first each independent variable with the outcome variable checked using bivariate logistic regressions. And those variable p value $\leq 0.3$ were selected and imported for further analysis using multiple logistic regressions.

In multiple logistic regressions, those variables' p value $\leq 0.05$ were considered as statistically significant and presented using adjusted odds ratio, 95% confidence interval and P- value.

For qualitative component, data were categorized in to concepts and then description and interpretation was made.

**Ethical consideration**

Ethical clearance was obtained from Research Ethical Review Board of Wollo University, College of medicine and health sciences. Before enrolling any of the eligible study participants, the objective, the benefits and the potential discomforts like time spent for interview (30 minute) was described and discussed with each participant. Only those who were willing to take part in the study and gave a written consent freely were included in the study

**Results:**

**Socio-Demography**

A total of 270 sampled health professionals responded to the questionnaire, which yields 100% response rate. Out of the total respondents, 176(65%) were male participants and 258(95.6) were Amhra ethnic group. Regarding religion of respondents, 168(62.2%) were Christian orthodox followers and 132 (48.9%) participants were diploma nurses.

Concerned to knowing one's blood group status among sampled health care providers, 213(78.9%) were know their blood group, of

those 79(37.1%) were belongs to O blood group and 202(94.8%) were RH positive. Regarding year of working experience, 177(65.6%) participants had less than five year experience and the rest were above five year.

**Table 1: Socio-demographic Characteristics of sampled health professionals in Dessie public health facility, June 2016. (n= 270).**

| Variables | frequency | percent(%) |
|---|---|---|
| **Sex** | | |
| Male | 176 | 65.2 |
| Female | 94 | 34.8 |
| **Ethnic group** | | |
| Amhara | 258 | 95.6 |
| Others* | 12 | 4.4 |
| **Age** | | |
| ≤ 30year | 187 | 69.3 |
| >30year | 83 | 30.7 |
| **Religion** | | |
| Orthodox | 168 | 62.2 |
| Muslim | 93 | 34.4 |
| Others** | 9 | 3.4 |
| **Marital status** | | |
| Married | 125 | 52.2 |
| Single | 141 | 46.3 |
| Divorced/widowed | 4 | 1.4 |
| **Occupational status** | | |
| Diploma Nurse | 132 | 48.9 |
| Diploma MLAB | 16 | 5.9 |
| BSC Nurse | 64 | 23.7 |
| Health officer | 14 | 5.2 |
| BSC MLAB | 9 | 3.4 |
| BSC midwifery | 13 | 4.8 |
| Doctor (MD) | 17 | 6.3 |
| Others*** | 5 | 1.8 |
| **Monthly income in Birr** | | |
| ≤ 3000 | 168 | 62.2 |
| >3000 | 102 | 37.8 |
| | | |
| **Availability of blood donation services in the facility** | | |
| Yes | 180 | 66.7 |
| No | 90 | 33.3 |

| | | | |
|---|---|---|---|
| **Knowing one'e blood group status** | | | |
| | Yes | 213 | 78.9 |
| | No | 57 | 21.1 |
| **Types of blood group** | | | |
| | A | 48 | 22.5 |
| | B | 56 | 26.3 |
| | AB | 30 | 14.1 |
| | O | 79 | 37.1 |
| **RH category** | | | |
| | RH+ | 202 | 94.8 |
| | RH– | 11 | 5.2 |

MLAB: Medical laboratory, Other* :Tigre and Oromo Others**:Protestant and catholic Other***: pharmacy, anesthesia

**Knowledge related to blood and blood donation practice**

Out of total participants, 159(58.9%) know that the infection can transmitted while blood transfusion, of which 96.6% were mentioned HIV, followed by 89.9% HBV. Similarly about 163(60.3%) participants know the amount of blood can be donated at each time.

Concerning to source of blood donation, 202(74.6%) and 37(13.7%) participants mentioned voluntary and self donor as source of blood donation respectively.

Regarding time spent for blood donation practice, 92(34.1%) participants mentioned that it takes less than 20 minutes. Similarly concerning to minimum time interval between donation practices, 175(64.8) participants mentioned that it should be every 3 months.

Regarding the minimum age and weight to donate blood, 158(58.5%) and 164(60.7%) participants know the correct answer. Similarly 164(60.7%) participants know the effect of blood pressure on blood donation practice (Table2)

**Table 2: Knowledge related to blood and blood donation practice in sampled health professionals in Dessie public health facility, June 2016. (n= 270).**

| Variables | Frequency | % |
|---|---|---|
| Can infection transmitted while blood transfusion? | | |
| yes | 159 | 58.9 |
| no | 111 | 41.1 |
| Disease transmitted while blood transfusion# (n=159) | | |
| HIV | 153 | 96.6 |
| HBV | 143 | 89.9 |
| HCV | 113 | 71.0 |
| Syphilis | 113 | 71.0 |
| *Know the volume of blood donation at once?* | | |

| | | |
|---|---|---|
| yes | 163 | 60.3 |
| no | 107 | 39.7 |
| Source of blood donation | | |
| Voluntary donor | 202 | 74.8 |
| Replacement donor | 15 | 5.6 |
| Remunerated donor | 3 | 1.1 |
| Self donor | 37 | 13.7 |
| Don't know | 13 | 4.8 |
| How long does it take to give blood? | | |
| o less than 20 minutes | 92 | 34.1 |
| o 20-60 minutes | 97 | 35.9 |
| o Don't know | 81 | 30 |
| What is the minimum time interval between donation practices? | | |
| o A month | 22 | 8.1 |
| o Two month | 11 | 4.1 |
| o Three month | 175 | 64.8 |
| o Four month | 34 | 12.6 |
| o Five month | 28 | 11.4 |
| Do you know the minimum age limit to donated blood? | | |
| yes | 158 | 58.5 |
| no | 112 | 41.5 |
| Do you know the minimum weight to donated blood? | | |
| yes | 164 | 60.7 |
| no | 106 | 39.3 |
| Do you know the number of days donated blood stored at 2-4$^{o}$C? | | |
| yes | 161 | 59.6 |
| no | 109 | 40.4 |
| Do the blood pressure measurement have effect on blood donation? | | |
| yes | 175 | 64.8 |
| no | 95 | 35.2 |

Note: # -multiple responses,

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**Attitude on blood donation practice**

Concerning the attitude of health professionals on blood donation practice, about 70(25.9%) of participants believed that donation makes weak and 97(35.9%) participants think that blood donation can leads to anemia.

Similarly, 58(21.5%) participants believed that blood donation reduce immunity and exposed to sickness and 237(87.8%) participants agreed that blood donation practice was life saver

**Table 3: Attitude on blood donation practice of sampled health professionals in Dessie public health facility, June, 2016. (n= 270).**

| Variables | frequency | percent(%) |
|---|---|---|
| Do you think blood donation makes you weak? | | |
| yes | 70 | 25.9 |
| no | 200 | 74.1 |

| | | |
|---|---|---|
| Do you think blood donation can leads to anemia? | | |
| yes | 97 | 35.9 |
| no | 173 | 64.1 |
| Do you think blood donation can leads to reduce immunity? | | |
| yes | 58 | 21.5 |
| no | 212 | 78.5 |
| Do you think you feel sick after donation? | | |
| yes | 58 | 21.5 |
| no | 212 | 78.5 |
| Do you think that blood donation is life saver? | | |
| yes | 237 | 87.8 |
| no | 33 | 12.2 |
| Do you think any person can donate blood? | | |
| yes | 69 | 25.6 |
| no | 201 | 74.4 |
| Do you think that blood donation practice is bad? | | |
| yes | 20 | 7.4 |
| no | 250 | 92.6 |

**Blood donation practice**

Out of 270 sampled health professionals, 86(31.9%) participants had donated blood so far. Of those, 27.9% and 26.7% were donated blood one and two times in their life time respectively. The main reasons for donation was voluntary donation (53.4 %) followed by family sickness (26.7%). Similarly, the reason for not donating blood includes fear of side effect or discomfort after donation, fear of knowing HIV status and sickness.

Regarding the current practice, 47(53.4%) was donated blood in the last one year period and of which 19 participants were donated in the last two months.

**Table 4: Blood donation practice in sampled health professionals in Dessie public health facility, June 2016. (n= 270).**

| Variables | Frequency | % |
|---|---|---|
| *Have you ever donated blood so far?* | | |
| yes | 86 | 31.9 |
| no | 184 | 68.1 |
| *If you donate, how many times* | | |
| One times | 24 | 27.9 |
| Two | 23 | 26.7 |
| Three | 15 | 17.4 |
| Four and above | 24 | 27.9 |
| *Reason for donation (n=86)#* | | |
| Voluntary | 46 | 53.4 |
| Family sickness | 23 | 26.7 |
| Both | 17 | 19.9 |
| *Reason for not donating (n=184) #* | | |

| | | |
|---|---|---|
| - *Fear of side effect or discomfort after donation* | | *118 (64.13%)* |
| - *No privacy while donation* | | *15 (8.15%)* |
| - *Need to donate for a friend or relative in future* | | *27(14.67%)* |
| - Fear of needle | | 68 (36.95%) |
| - Fear of knowing their HIV status | | 82 (44.56%) |
| - The donated blood may be soled | | 12 (6.5%) |
| - No remuneration | | 13 (7.06%) |
| - Religion prohibits blood donation | | 22 (11.95) |
| - Being not felt | | 27 (14.67) |
| - No one has asked again to donate blood | | 36 (19.56) |
| *Have you donatde in the last one year period?* | | |
| yes | 47 | 53.4 |
| no | 41 | 46.6 |
| *Have you donate in the last two month?* | | |
| *yes* | *19* | *22.1* |
| *no* | *67* | *77.9* |
| *Are you willing to donate blood in the future?* | | |
| *yes* | *200* | *74.1* |
| *no* | *70* | *25.9* |

Note: # -multiple responses

**Factors associated with blood donation practice**

Knowing one's blood group type had positively associated with blood donation practice. Those heath professional who know their blood group type were five times more likely to donate blood as compared to those health individual who didn't know their blood group status, [AOR:5.03(1.814-3.95)].

Similarly, knowing the amount of blood volume at each donation had positively associated with blood donation practice; those health professional who know the volume of blood at each donation were 1.83 times more likely to donate blood as compared to those who didn't know; [AOR: 1.83;(1.27-3.472)]

Time spent for blood donation, those health professionals who say less than 20 minutes and 20-40 minutes were 1.92 and 1.47 times more likely to donate blood as compared to those who didn't know.

Those health professionals who know the minimum weight should have to donate blood were 2 times more likely to donate blood as compared those who didn't know the minimum weight to donate: [AOR:2.00; (1.052-3.813)].

**Table : Bivariate and multiple logistic regression analysis on factors associated with Blood donation practice among health care workers in Dessie town, North East Ethiopia, June 2016. (n=270)**

| | Ever Blood donation | | | |
|---|---|---|---|---|
| **Variables** | **yes** | **no** | **COR (95%CI)** | **AOR (95% CI)** |
| | | | | |
| Sex | | | | |
| - Male | 51 | 125 | 0.688(0.405-1.168)* | |
| - Female | 35 | 59 | 1 | |

| | | | | |
|---|---|---|---|---|
| Do you know your blood group type so far? | | | | |
| - Yes | 81 | 132 | 6.382(2.45-1.64) | 5.03(1.814-3.95) ** |
| - No | 5 | 52 | 1 | 1 |
| Know the amount of blood volume at a single donation | | | | |
| - Yes | 66 | 97 | 2.96(1.66-5.28) | 1.83(1.27-3.472) ** |
| - no | 20 | 87 | 1 | 1 |
| Time spent for a single donation | | | | |
| - <20 minute | 29 | 63 | 2.03(0.99-4.1) | 1.92(1.22-3.27) ** |
| - 20-40 minute | 42 | 55 | 3.36 (1.67-6.67) | 1.47(1.15-5.42) ** |
| - Don't know | 15 | 66 | 1 | 1 |
| Do you know the minimum age limit to donated blood? | | | | |
| | | | | |
| - yes | 64 | 94 | 2.78(1.58-4.9)* | |
| - no | 22 | 90 | 1 | |
| Do you know the minimum weight limit to donated blood? | | | | |
| - Yes | 66 | 98 | 2.896(1.63-5.16) | 2.00(1.052-3.813) ** |
| - No | 20 | 86 | 1 | |
| Do you think blood donation make weak immune? | | | | |
| - Yes | 23 | 35 | 1.52(0.85-2.8)* | |
| - No | 63 | 149 | 1 | |
| Age of respondents | | | | |
| - <30 year | 55 | 132 | 0.69(0.41-1.2)* | |
| - ≥30 year | 31 | 52 | 1 | |
| Marital status of respondents | | | | |
| - Non married | 41 | 104 | 0.709(0.42-11.17)* | |
| - Married | 45 | 80 | 1 | |

***p<0.3, **p<0.05**

**Discussion**

This study show that life time blood donation among health care professionals was 31.9%, which was consistent with the study done in Addis Ababa (32.6%) (21). In contrast, it is higher than study done in different countries (13-16, 20, 21, 22, and 23) and lower than other studies (17, 18). The possible reason for this discrepancy may be due to time variation in which the study conducted and socio-demographic difference in the study areas.

Of those blood donars, 27.9% were donated blood one time in their life time. This finding was higher than studies done in India and Botswana (13, 14, and 16). This may be due to year of difference in which the studies done since health professional were update in day to day practice.

In this study, 53.4% blood donors were from voluntary source. This was comparable to

study done in Nigeria teaching hospital among physicians (18) and higher than study done in Addis Ababa among health care workers (21). So, this finding suggest that there is an improvement from family based donation to sense of voluntary but it is far less as compared to National requirement.

The most cited reasons for not donating were fear of side effect or discomfort after donation, fear of knowing once HIV status while donation and fear of needle. This finding was in line with studies done in India (13, 14, and 17). This justifies that health professional alone is not enough to donate blood.

Knowing one's blood group type had positively associated with blood donation practice. Those heath professional who know their blood group type were five times more likely to donate blood as compared to those health individual who didn't know their blood group status, AOR:[5.03(1.814-3.95)]. The possible justification for this association could be due to that those health's professional who know their blood group may easily donate blood to another individual with the same type who is in critical.

Knowing the amount of blood volume at each donation had positively associated with blood donation practice which is in line with study done in India (15). This was complemented descriptive result which shows most health professionals believe that donating blood would result anemia and lower immunity so that fail to donate blood.

Time spent for blood donation, those health professionals who say less than 20 minutes and 20-40 minutes were 1.92 and 1.47 times more likely to donate blood as compared to those who didn't know. This association could be due to that health care providers who assumed blood donation procedure take time or didn't know exact time; they fail to donate blood since they are busy workers.

Similarly, knowing the minimum weight an individual to donate blood had positively associated with blood donation. This could be due to that those health care providers who didn't know minimum weight an individual to donate were fail to donate, even if they were competent to donate.

**Conclusion**

This study shows that proportion of blood donation practice were low as compared with its life saving importance specially.

Knowing once blood group, knowledge on blood donation practice, attitude on blood donation practice and family discussion on blood donation were statically significant factor for blood donation practice.

Health professional should know their own blood type which makes easy to donate blood for the one who need or blood bank.

NGO or zonal health office should provide continuous education and training to health care providers to close existing knowledge and attitude gap.

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