ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

KNOWLEDGE ON MATERNAL HEALTH BENEFITS OF DONATED BLOOD AND BLOOD DONATION AMONG UNIVERSITY STUDENTS.

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Declaration

I, the undersigned declare that this thesis is my original work, and has not been presented for a degree in this or another university and that all sources of materials used for the thesis and all people and institutions that gave support for this work have been duly acknowledged.

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Date of submission- 27 / 06 / 2016 GC **Signature** _____

Advisor's Approval Sheet

This is to certify that the thesis entitled " knowledge on maternal health benefits of donated blood and blood donation among university students " is submitted in partial fulfillment of the requirements for the degree of MPH with specialization in "Reproductive health and family health" to the Graduate Program of the School of Public Health at Addis Ababa University and has been carried out by **Amanuel H/selassie G/medhin** under my supervision.

The student has fulfilled the thesis requirements and hence here by can submit the thesis to the school of public health.

Name of advisor: Dr. Assefa Seme

Date of submission - 27 / 06 / 2016 GC **Signature**_____

Examiners' Approval Sheet

We, the undersigned, members of the Board of Examiners of the final open defense by **Amanuel H/selassie G/medhin**, have read and evaluate his thesis entitled "knowledge on maternal health benefits of donated blood and blood donation among university students". This is to certify that the thesis has been accepted in partial fulfillment of the requirements for the MPH Degree in "Reproductive Health and family health".

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Acronyms

AASTU---------- Addis Ababa Science and Technology University

AOR ----------Adjusted Odds Ratio

BB ---------- Blood Bank

CI ---------- Confidence Interval

COR ----------Crude Odds Ratio

DOMAINE---------- Donor MAnagement IN Europe

FMOH ---------- Federal Ministry of Health

HICs ---------- High Income Countries

JHPIEGO ---John Hopkins Program on International Education in Gynecology & Obstetrics

LMICs ---------- Low and Middle Income Countries

NBBS ---------- National Blood Bank Service

NGO'S---------- Non Governmental Organizations

SD ---------- Standard Deviation

SPSS---------- Statistical Package for Social Science

SSA ----------Sub-Saharan Africa

UNFPA ----------United Nations Fund for Population Activities

VNRBD ----------Voluntary Non-Remunerated Blood Donation

VBD ---------- Voluntary Blood Donation

WHO ---------- World Health Organization

Abstract

Background-Access to a safe and sufficient blood supply could avert up to 150,000 pregnancy related deaths globally each year. At minimum, the World Health Organization estimates that a country needs 1% to 3% of its population to donate blood to meet its need.Yet, many African countries including Ethiopia are far below the minimum blood collection rate. This gap between blood supply & demand has a significant impact on maternal mortality in SSA countries where 26% (16–72%) of maternal hemorrhage related deaths were due to lack of blood for transfusion. Different studies in developed and developing countries show a knowledge gap on the benefit of blood donation, unfavorable attitude & poor practice of blood donation. In Ethiopia, however, there are few studies conducted on this important area.

Objective- To assess knowledge on maternal health benefits of donated blood, attitude & practice of blood donation & associated factors among Addis Ababa Science & Technology University students.

Methods- A cross-sectional study was conducted among 421 students in Addis Ababa Science and Technology University who were selected through a stratified random sampling technique. Pre-tested questionnaire was used to collect data through a face to face interview. The data was coded and entered into EPI info version 7.0, cleaned in SPSS version 20.0 and analyzed in STATA 12.1. Then, descriptive statistics and two step (bivariate and multivariate) logistic regressions analyses was applied.

Result- Among 421 respondents, 245 (58.19%) respondents had good knowledge about maternal health benefits of donated blood & 221 (52.49%) respondents had favorable attitude towards blood donation. About a quarter of study participants (105, 24.94%) had donated blood. Studying in biological science [AOR, (95% CI), 2.95 (1.16, 7.49)], being from wealthier families [AOR, (95% CI), 2.85 (1.36,5.97)] , family history of blood transfusion [AOR, (95% CI), 3.49 (1.89,6.45)], good knowledge about maternal health benefit of donated blood [AOR, (95%CI), 3.94 (1.97, 7.89)] & favorable attitude towards blood donation [AOR, (95%CI), 5.03 (2.63, 9.62)] were significantly associated with blood donation.

Conclusion/recommendation- Knowledge about maternal health benefit of donated blood, favorable attitude and practice of blood donation is low. So, NBBS of Ethiopia should work jointly with all stakeholders (Government institutions, NGO's, Community Based Organizations, Media and Private organizations) to create more awareness and sensitization about the need of blood for maternal health & increase number of blood donors.

1. Introduction

1.1 Background

Blood donation is a voluntary procedure in which the donor agrees to have blood drawn so that it can be given for someone who needs a blood transfusion. Blood transfusion is an indispensable component of health care & patients who require blood as part of their clinical management have the right that sufficient blood will be available to meet their needs [1].

Every year, an estimated 303,000 women die worldwide from complications related to pregnancy and childbirth [2]. Nearly two-thirds of these maternal deaths (66.3%) occur in sub-Saharan Africa, with severe bleeding as the leading direct cause accounting for 24.5% of maternal deaths in this region [2, 3].

Blood transfusion is one of eight key life-saving functions of comprehensive emergency obstetric care & 37% of red blood cell donation in developing countries is transfused for pregnancy related health problems. So, access to a safe and sufficient blood supply could help prevent deaths of a significant number of mothers and their newborn children. As per estimates globally, each year up to 150,000 pregnancy related deaths could be avoided through access to safe blood [4, 5]. In a study done in Rajasthan, increasing the availability of blood transfusion saved nearly 70% of lives due to hemorrhage [6]. Similarly, estimates show that if the First Referral Units in India were equipped with a proper blood supply, they could reduce maternal mortality by 30% [7]. All these evidences prove that attempts to improve maternal health will not be achieved without persistent efforts to develop safe and sustainable blood supplies [8].

The National Blood Bank Service of Ethiopia was established in 1969 GC mainly through Ethiopian Red Cross Society then in 2012 GC, it has been transferred to FMOH of Ethiopia. It provides service through 25 regional blood banks country wide [9]. The WHO global framework for action has developed twenty well-defined strategies to achieve 100% voluntary blood donation. It serves as a guide for developing programs which are implemented at community, regional, national and international levels. Some of the strategies are incorporating blood donation in national blood policy, mobilizing youth blood donors, donor education and community involvement, building partnerships with the media, ensuring convenience of service and providing quality donor service [1].

1.2 Statement of the problem

The number of blood donations per 1000 people is commonly used as a proxy indicator for the availability and adequacy of the blood supply in a given country. At a minimum, WHO estimates that a country needs 1% to 3% of its population to donate blood in order to meet its need [1].

Global status of blood collection

Globally, around 108 million blood units were collected in 2013. Approximately half of these were collected in high income countries, home to only 18% of the world's population. Blood donation rate in high income countries was 36.8 donations per 1000 population while in middle and low income countries the number of donations per 1000 population was 11.7 and 3.9 donations, respectively. Out of 75 countries that had donation rates of less than 1% of the population (fewer than 10 donations per thousand people), 40 countries were in WHO's African region,8 in the Americas, 7 in the Eastern Mediterranean Region, 6 in Europe, 6 in South-Eastern Asian and 8 in the Western Pacific [10].

Africa

The 2010 survey report shows that a total of 3, 486,192 units of blood were collected which is less than half of the total demand.The average annual blood donation rate was 4.3 units per 1000 population with a range from 0.2/1000 in Nigeria to 33.8/1000 in Mauritius. Only five countries (Algeria, Botswana, Congo, Mauritius and South Africa) were collecting at least 10 units/1000 populations [11].

Ethiopia

Despite the fact that total blood collection increased from 24,000 units per annum in 2004 to 95,466 in 2013, there is still inadequacy and in-equitability in access to blood in Ethiopia. Ethiopia is categorized as one of the countries with very low blood donation rate which is 0.6 per thousand populations next to Nigeria [9, 11].

Currently, the proportion of health facilities accessing safe blood and blood products from the NBBS of Ethiopia and its network is 52% [12]. This means lack of blood supply as one of the three delays has a significant impact on women with complications of pregnancy and their newborn babies since there is limited access of bloodin comprehensive emergency obstetric care [13]. Study in SSA countries (including Ethiopia) described a direct association between

maternal deaths and lack of blood transfusions where overall 26% (16–72%) of maternal hemorrhage deaths were due to lack of blood for transfusion [14].

Inadequate blood supply still remains a key challenge.The key challenges to progress include unwillingness, poor community awareness of the importance of VNRBD, social taboos and misconceptions, limited infrastructural expansion of services, inadequate staff, limited donor counseling & access to media [1,11, 15-17].

Different studies in developed and developing countries show a knowledge gap on the benefit of blood donation, unfavorable attitude towards VNRBD & poor practice of blood donation on regular bases. So, current effective strategy for strengthening blood collection and supply program is to make maximum effort to recruit blood donors from youth and low risk groups where 41% of reported voluntary blood donors are under the age of 25 years [9, 18]. In Ethiopia, however, there are very few researches conducted on the same area. The aim of the current study is to assess whether or not university students blood donation is based on their knowledge of maternal health benefits of the donated blood and also to assess their attitude and practice towards blood donation.

1.3 Significance of the study

The progress in meeting the national demand of blood is not satisfactory despite the fact that various efforts are made from programmatic to institutional and community level. The newly launched Health Sector Transformation Plan also gives an emphasis to ensure adequate access of blood country wide [11]. Although there are a number of published literatures across the developing world on the area of blood donation, it is barley available to find study conducted on outside health professionals or medical students. And most of them don't assess knowledge about maternal health benefits of blood donation and institutional factors. Moreover, local published literatures regarding blood donation are rare. Thus, this study is primarily intended to provide information on the level of knowledge about maternal benefits of donated blood, attitude and practice of blood donation and associated factors. The finding of the study will help also to identify the gaps and challenges in promoting blood donation practice & recommend major areas of intervention to NBBS and different concerned bodies working on maternal health area. Ultimately, it will contribute for reduction of maternal mortality due to lack of blood for transfusion by ensuring adequate blood supply. Furthermore, it will help as base line information for further studies.

2. Literature review

The disparity in blood donation rates between low, middle and high income countries is well documented but less is known about reasons for this inequity. More young people aged 18-24 years account for 41% of donor population in LMICs while in HICs, donors aged 25-44 years account for 39% of donor population [9]. The lancet review of 196 countries showed that the reasons for difference in blood collection are multifactorial such as poor infrastructure (28 LMICs and four HICs), low public awareness (22 LMIC), stigmas (especially in LMICs) and inaccessibility of BB and donation centers in rural areas [19].

2.1 Knowledge of maternal health benefit of blood

Generally, the level of awareness about blood donation is high. A study done in Nigeria showed that 98.4 % of the respondents were aware about blood donation. The main sources of information were heath worker (51.6%) & mass media (26.6%) [20]. A study conducted in Puducherry, India indicates that 229 (79.5%) of the respondents were aware of blood donation. The sources of information were media (48%) & health worker (19.7%) [21]. A study in University of Lagos showed that 88.5% has heard about blood donation and the source of information were billboards (49.2%), newspaper/magazine (44.2%), parent, sibling and relatives (40.8%) and television or radio (40.8%) [22]. In Botswana,over four-fifths of the study participants had heard about blood donation in the past. The major sources of information on blood donation were school (35.8%), health facilities (26.6%), and media (30.6%) [23].

In most studies, knowledge about indication of blood transfusion for pregnancy related health probolems is low. A study done Nigeria where around two third (58.5%) of the respondents had the knowledge that blood transfusion may be required for pregnant women [16]. A Study done in Nigeria found that good knowledge about maternal health benefit of donated blood was 60%. Majority of respondents had good knowledge about pregnancy related conditions requiring blood transfusion like spontaneous abortion (44.0%), blood shortage (73.6%), Caesarean section (41.8%), antepartum and postpartum hemorrhage (81.4%) [20].A study in Nigeria among adults shows the knowledge of indication for blood transfusion for child deliverywas 46.2% [24].

A study in colleges of Nepal revealed that 79.4% of respondents couldn't answer the indication of blood transfusion and only two students gave correct reasons for blood donation (for hemorrhage due to traffic injury, pregnancy related cases and surgery) [25]. A study conducted in India also found that 2.6% of respondents know pregnancy related cases as indication for blood donation [21].

2.2 Attitude towards blood donation

In most studies, the level of attitude towards blood donation is good. A study conducted among adults in Karnataka, India found that the proportion of good, average and poor attitude was 84 (59.4%),28 (19.9%) & 29 (20.6%) respectively [26]. In Gulbarga and Kollam 75.61% & 90% of respondents have a positive attitude towards blood donation respectively [27, 28].

A study conducted inUniversity of Lagos, south India, Karachi, Ambo University, Addis Ababa University& Addis Ababa Health Facility showed that 83%, 87.3%, 42%, 47.4%, 68% & 81.7% of the respondents had positive attitude towards blood donation respectively [22, 29- 33].

2.3 Practice of blood donation

Different studies have shown that the proportion life time and a regular blood donor is low.

A study in Maryland showed that 228 (59%) of the participants had donated blood at least once in the past [34]. A study in Botswana & Municipality of Pelotas in Southern Brazil found prevalence of ever donated (27.1% & 32%), donated in past one year (12.5% & 7.7%) and regularly (9.6% & 3.6%) respectively [23, 35].

A study in Nepal revealed that only 32 (18.1%) respondents donated [25]. A study conducted among medical science students in India revealed only few (37, 13.9%) had ever donated blood, of which 24 (64.8%) donated in the last one year [36]. A study conducted in Puducherry, India found that 40 (17.5%) donated in the past [21]. A study conducted in Krishna hospitalshowed that 49% donated only once [37].

A study conducted among adults in Saudi Arabia, Nigeria & Cameron showed that 53.3%, 15% & 39% of the respondents donated blood previously respectively [38-40]. A study done in King Abdul-Aziz medical city showed that 160 (55.6%) had history of blood donation of which 31.9% & 3.1% donated once and every year respectively [41].

A study conducted in University of Benin teaching hospital indicated that 58 (41.4%) donated blood before of which 33 (56.9%) donating less than once a year [42]. A study in Kenya showed that 187 (41.0%) of respondents had ever donated blood of which 53.5% had donated blood once in the last 12 months [43].

Studies in Togo, Iran, Congo, Lagos, south India & University ofcentral India have showed that history of blood donation was 31.6%, 37.9%, 54.9%, 35.5%, 10.75% & 47.5% respectively [44-49].

In study conducted in Ambo University, 94 (23.6%) had ever donated blood of which 94 (14.5%) donated before one year [31]. In study conducted among health science students of Addis Ababa University, less than one quarter (90, 23.4%) had ever donated blood of which regular donors were 38 (42.2%) [32]. A study done in Addis Ababa Health Facility professionals showed that 32.6% of the respondents have donated blood in the past [33].

2.4. Factors & perceived barriers for practice of blood donation

Most studies showed the common reasons for not donating were inaccessibility of blood donation centers, fear related to donation process, medical unfitness, parental or friend opposition, lack of information related to the service, lack of opportunity & time [21, 23, 31, 32, 38, 39, 43, 44]

A study in Nepal, Addis AbabaUniversity, Addis Ababa Health facility, Maryland, Southern Brazil, Saudi Arabia, King Abdul-Aziz medical city & Kerman city revealed that being male sexwas significantly associated with blood donation [25, 32-35, 38, 41, 50]. But, in University of Benin teaching hospital sex wasn't found to be associated [42].

Study done in Addis Ababa University, Southern Brazil & King Abdul-Aziz medical city showed age was associated with history of blood donation [32, 35, 41]. But, in Saudi Arabia age was not associated with history of blood donation [38].

A study in Sri Lakshmi Narayan Institute, India showed that practice section 3rd year student's showed significantly higher practice than that of 1st and 2nd years [51].

A Study done in Saudi Arabia, King Abdul-Aziz, Kerman city & Sri Lakshmi Narayan Institute showed that higher attitude was significant predictor of blood donation [38, 41, 50, 51].

A study in Ambo showed that those with literate family and who received blood from blood bank were associated with more tendencies to donate blood [31]. Whereas, study in Saudi Arabia indicates that history of blood transfusion was n't associated with blood donation [38].

A study in Nepal revealed that participating in organizing blood donation was significantly associated with blood donation while in Brazil it was not [25, 35]. Study done in King Abdul-Aziz shows knowing location of BB was associated with history of blood donation [41].

A study in Nigeria indicated that respondents with good knowledge of antenatal blood donation were willing to donate blood ($\chi 2$ =13.185; df =1; P = 0.0006) [20].

3. Conceptual framework of blood donation

Since there was no previous conceptual framework developed for blood donation, it was developed by reviewing various literatures. It consists of six categories of independent variables like individual, contextual, medical, service related factors, knowledge about maternal health benefits of donated blood and attitude towards blood donation which have relation with the outcome variable (practice of blood donation). In this conceptual framework a simple linear association is considered (Figure I).

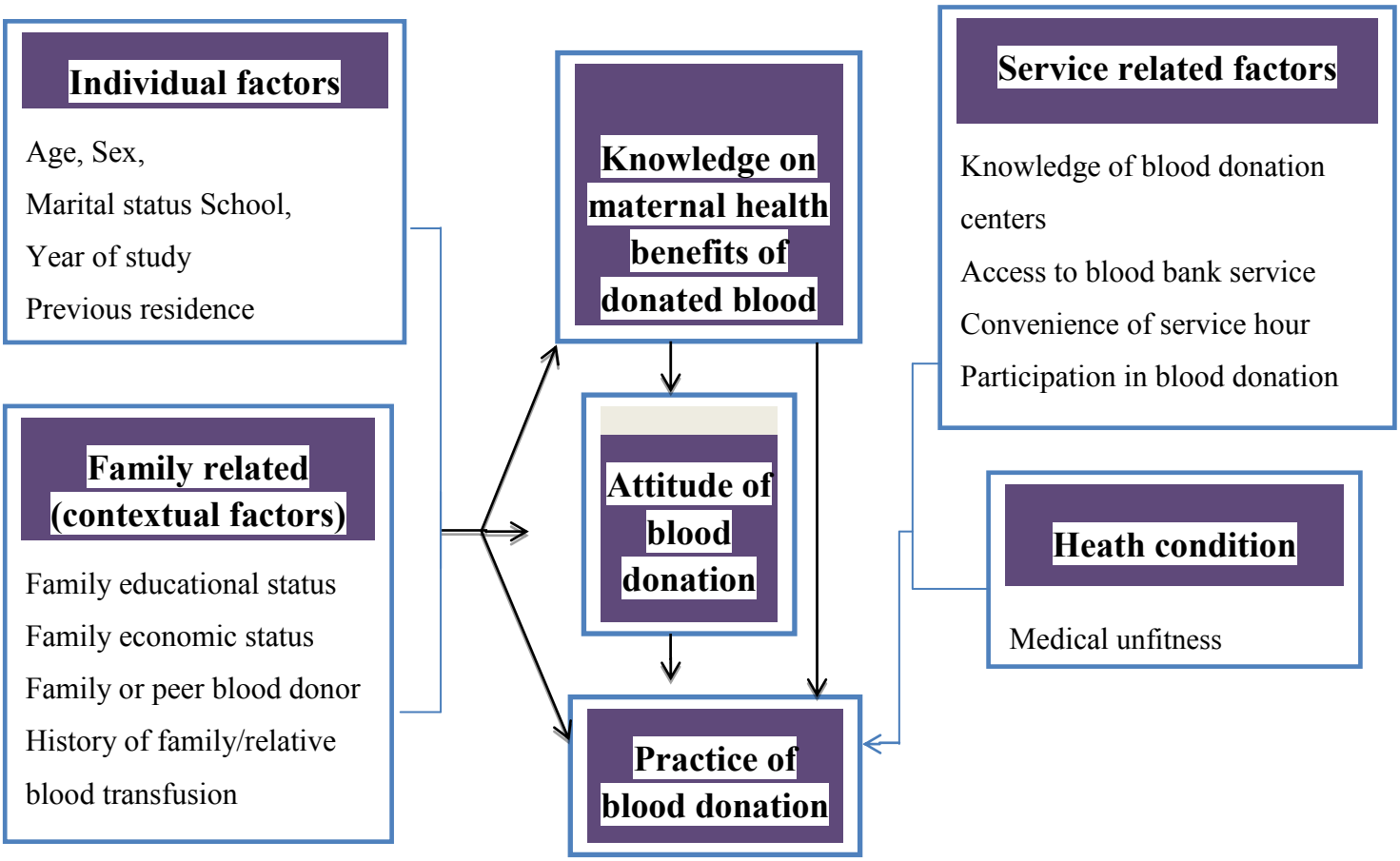

Figure I- conceptual framework of blood donation

4. Objectives

4.1 General objective

- To assess knowledge on maternal health benefits of donated blood, attitude and practice of blood donation and associated factors among Addis Ababa Science and Technology University students.

4.2 Specific objectives

4.2.1 To assess knowledge about the health benefits of donated blood to mothers among Ababa Ababa Science and Technology University students.

4.2.2 To determine attitude towards blood donation among Addis Ababa Science and Technology University students.

4.2.3 To estimate proportion of Addis Ababa Science and Technology University students who had ever donated blood.

4.2.4 To identify factors associated with practice of blood donation among Addis Ababa Science and Technology University students.

5. Methodology

5.1 Study design & period

An institution based cross-sectional study using quantitative method was conducted from July 13, 2015 - June 2, 2016 GC.

5.2 Study area

AASTU is one of the two Science and Technology Universities established in the country. It was established in 2011GC and started its first academic year in September 2011GC. AASTU is located in the national capital of the country, Addis Ababa and at the heart of the industrial zone of Kaliti-Akaki sub-city. The University has 8 schools and 21 departments. A total of 6772 regular undergraduate students were enrolled in the academic year of 2015/6 GC where 4,721 were male & 2,051 were female students.

5.3 Source populations

- All regular undergraduate students in Addis Ababa Science and Technology Universitywere enrolled in the academic year of 2015/6 GC.

5.4 Study participants

- All regular undergraduate students randomly selected.

5.5 Inclusion and exclusion criteria

5.5.1 Inclusion criteria

- All regular undergraduate students enrolled during the data collection time.

5.5.2 Exclusion criteria

- All students who had communication difficulty (who can't hear or speak).
- Those students who were seriously ill.

5.6 Sample size determination

EPI info version 7.0 software was used to compute sample size by using an assumption of the proportion which gives maximum sample size. After calculating the sample size for each specific objective, proportion of 47.4% was used in single population proportion formula & the final total sample size was calculated to be 421 (**see annex, table 7**).

$n_i = \frac{\left(\frac{z\alpha}{2}\right)^2 (pq)}{d^2}$ =383 Where n_i= initial sample size , n_f= Final sample size

$n_f = n_i + 10\%(n_i) = 421$ $z = 1.96, w =$ margin of error 5%, $p = 47.4\%$

5.7 Sampling technique

A total of 6,772regular undergraduate students were currently attending the study in eight schools of AASTU under 21 departments. A stratified random sampling procedure was employed according to the departments and year of the study. After identifying the number of students in each department with their respective year of study,the sample for each stratum was distributed using the proportional allocation to size formula. Then, a list of students identification number taken from office of registrar was entered into computer. Finally, participants were selected by simple random sampling technique from each sub-stratified population proportionally (**see annex, table 8, figure VI**).

5.8 Variables

5.8.1 Dependent Variable

- Practice of blood donation- Ever donated blood

5.8.2 Independent Variables

- Age, sex, class year, marital status, previous place of residence, religion, ethnicity, family income and family educational status., family, relative or peer blood donor and history of family or relative blood transfusion, knowledge of maternal health benefits of donated blood, attitude towards blood donation, history of medical deferral, knowing the location of blood bank, access to blood bank service, participation in blood donation campaign and service hour convenience.

5.9 Operational Definitions

Level of knowledge- Knowledge was assessed by ten questions which focus on awareness of blood donation, benefit of blood during pregnancy, use of blood for specific pregnancy related cases (four components), blood tansfusion as component of obstetric care, contribution of access to blood in reducing maternal death, volume and frequency of blood donation. Each response was scored as zero (if incorrect) and one (if correct). Based on total score, the level of knowledge about maternal health benefit of donated blood was categorized based on mean value. Respondents were categorized as having poor knowledge if mean score is less than 6 points and good knowledge if mean score is 6 and above points.

Level of attitude- The attitude was assessed through eight questions with five point Likert scale. Each response for positive questions was given a specific weight which ranges from one (for strongly disagree) to five point (for strongly agree). While negative questions were reversely coded from one (for strongly agree) to five point (for strongly disagree). After computing the attitude score, the mean value was used as cut point. Respondents who scored less than 30 were categorized as having unfavorable attitude towards blood donation while those who scored 30 or more were labeled as having favorable attitude towards blood donation.

Ever donated- is someone who made at least one donationin the past. In this study, practice of blood donation is measured by history of blood donation (ever donated in the past).

Regular donor- is someone who made at least two donations within the last 24 months. The last donation has been made within the last 12 months.

Family income level- was categorized using percentile into three groups. Respondents family income was categorized as low (<3500 birr), medium (3500-5000 birr) and high (>5000 birr).

Access to blood bank- was measured by time taken to reach blood bank through vehicle transport. So, journey time taking below an hour was considered as 'easily accessible' while one and above hour journey was considered as 'difficult to access.'

5.10 Data collection procedure

Data was collected through face to face interview using structured, pre-tested Amharic version questionnaire from February 15- March 2, 2016 GC. The questionnaire was prepared in English, translated to Amharic and finally back to English to ensure consistency. The questionnaire was adopted from previous studies and DOMAINE survey with some modification to fit the local context. The questionnaire has seven sections which comprises of socio-demographic & economic, knowledge about maternal benefit of donated blood, attitudetowards blood donation, practice of blood donation, contextual factors (family history of blood donation & transfusion), medical and service access related questions.A total of four (two male and two female) data collectors who were well trained on the purpose of the study, handling ethical issues and method of data collection facilitated the interview and one Public Health officer has supervisedthe data collection. The filled questionnaires were checked for consistencies and completeness by the supervisor and the principal investigator on the spot.

5.11 Data quality management

One day training was given to data collectors and the supervisor. The questionnaire was reviewed by experts who have experience in conducting blood donation researches in order to ensure its validity. Pre-test of the questionnaire was done on 5% of the sample size (21 students) on Arat kilo campus, to cross-check for objective and variable based completeness, consistency and acceptability of the questionnaire. The questionnaire was checked thoroughly for its completeness before it was distributed to data collectors. The participants were well versed with the objective of the study and were also ensured that their response will be kept confidentially so that they can give genuine answer. The principal investigator and the supervisor made close follow up and frequent checks on the data collection process to ensure the completeness and consistency of the gathered information. Some underestimated age of respondents was replaced by using the mode age of respondents within the same year of study.

5.12 Data analysis procedure

The collected data were coded and entered to computer with EPI info version 7.0, cleanedin SPSS version 20 by running each variable's frequency and cross tabulation to check missed variables and then finally exported to STATA version 12.1 for analysis. The normality of distribution of the data (age, family income, knowledge and attitude composite scores) was assessed by using histogram and kurtosis and skewness value. Then, descriptive statistics was summarized using percentage, frequency, mean, standard deviation and proportion and presented using bar graphs, pie charts and tables. Multi- collinearity of independent variables was also assessed which shows that the variance inflation factor and tolerance were within acceptable range. Two step (bivariate and multivariate) logistic regressions analysis was applied. A crude and adjusted odds ratio was computed for each explanatory variable to determine the strength of association with outcome variable and to control the effect of confounding factors, respectively. Variables statistically associated with the outcome variable at p-value ≤ 0.05 were taken from bivariate to multivariate logistic regression analysis to appreciate the maintenance of their association. The cut-off value for significance was set at a p value ≤ 0.05.

5.13 Ethical consideration

Ethical clearance was obtained from Ethical Review committee of School of Public Health and Institutional Review Board of College of Health Sciences, Addis Ababa University. This letter was submitted to concerned bodies in Addis Ababa Science and Technology University. The purpose and rationale of the study was briefly discussed to all study participants. They were assured about the benefit and non-maleficence of the study, fair selection for study participation through random technique, privacy and above all, they have the autonomy to decide whether to participate in the study or not. Written informed consent was taken from each participant before conducting interview. In all courses of the study period, the information of the participants was kept confidential.

5.14 Dissemination of result

Final copy of this study finding will be submitted to School of Public Health, College of Health Science's, Federal Ministry of Health, National Blood Bank Service, WHO Country Office for Ethiopia, UNFPA, JHPIEGO Ethiopia Country Office and Addis Ababa Science and Technology University. The finding of the research will be presented on seminar and manuscript will be developed and submitted for publication on peer reviewed scientific Journals.

6. Result

6.1 Socio-Demographic Characteristics

Among 421 students interviewed in the study, the response rate was 100%. Among the respondents, 315 (74.8%) were youths aged 20-24 years and their age ranges from 18 to 28 years with a mean age ± SD of 21 ±1.94 years. Two hundred fifty two (59.9%) participants were males. More than a quarter (116, 27.6%) students were attending in school of civil engineering & COTM. Majority (404, 96%) of the students were single. Majority of the students were Orthodox Christians (229, 54.4%) followed by Muslims (137, 32.5%). The ethnic distribution showed that most students were Oromo (187, 44.4%) and Amhara (142, 33.7%). Most of the students (245, 58.2%) were rural residents before they joined the university (Table 1).

Table 1- Socio-demographic characteristics of Addis Ababa Science and Technology University regular undergraduate Students, Ethiopia, 2016[n=421]

Variable	Frequency (n)	Percentage (%)
Sex		
Male	252	59.86
Female	169	40.14
Age		
18-19 year	81	19.2
20-24 year	315	74.8
≥25 year	25	5.9
School		
Architecture & Urban Plan Design	27	6.41
Biological & Chemical Science & Technology	51	12.11
Chemical & Material Science & Technology	34	8.08
Civil Engineering & COTM	116	27.55
Earth Science & Mining Engineering	23	5.46
Energy Resources & Environmental Engineering	34	8.08
Information Science & Technology	72	17.10
Mechanical & Manufacturing Engineering	64	15.20
Year of Study		
First	96	22.80
Second	75	17.81
Third	98	23.28
Fourth	94	22.33
Fifth	58	13.78
Marital Status		
Single	404	95.96
Married	17	4.04
Religion		
Orthodox	229	54.39
Muslim	137	32.54
Protestant	43	10.21
Catholic	12	2.85
Ethnicity		
Oromo	187	44.42
Amhara	142	33.73
Tigre	41	9.74
Gurage	19	4.51
Wolayta	12	2.85
Sidama	11	2.61
Others(Somali, Silte, Gambella)	9	2.14
Previous area of residence		
Urban	176	41.81
Rural	245	58.19

6.2 Family educational and economic status

Among the respondents, 286 (67.9 %) and 238 (56.5%) had a father and mother who attended school respectively. With regards to respondent's family economic status, 150 (35.63%) and 136 (32.3%) are categorized as coming from families with low and medium economic level, respectively (Table 2).

Table 2-Family educational & economic status of Addis Ababa Science and Technology University regular undergraduate Students, Ethiopia, 2016[n=421]

Variable	Frequency(n)	Percentage (%)
Father School attended		
Yes	286	67.93
Primary	91	31.82
Secondary	67	23.43
TVET	51	17.83
Higher	77	26.92
No	135	32.07
Mother School attended		
Yes	238	56.53
Primary	113	47.48
Secondary	51	21.43
TVET	30	12.61
Higher	44	18.49
No	183	43.47
Family economic status		
Low	142	33.73
Medium	162	38.48
High	117	27.79

6.3 Family history of blood transfusion and donation

Among the total respondents, 89 (21.1%) had family/relative who had received blood transfusion for clinical management. The indication for blood transfusion was maternal causes (35, 39.3%, medical causes (19, 21.3%), surgery (16, 18%), child illness (15, 16.9%) and hematological case (4, 4.5%). With regard to family/ peer blood donor, 137 (32.5%) had family/relative or friend who donated blood.

6.4 Knowledge about maternal health benefit of donated blood

From total respondents, majority [377, 89.55%, 95% CI: (86.6%, 92.5%)] have seen/ heard messages about blood donation. The main sources of information about blood donation were School/University (239, 63.39%), print media such as newspaper, leaflet, brusher, billboard (183, 48.54%) & electronic media such as television & radio (220, 58.35%) (Figure II).

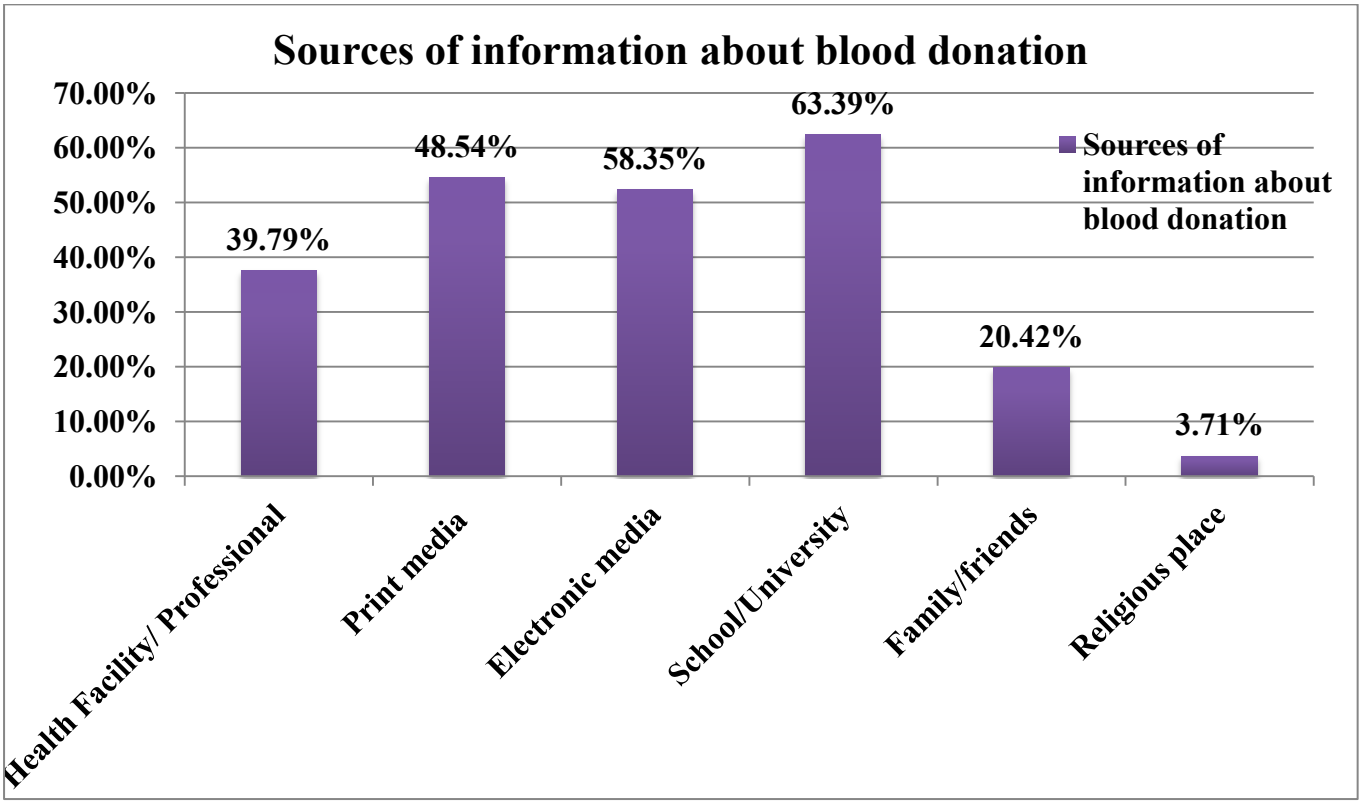

Figure II– Percentage distribution of sources of information about blood donation among AASTU regular undergraduate Students, Ethiopia, 2016 [Multiple responses possible, percent can't add up to 100]

Among the respondents, majority (344, 81.71%) knew that donated blood is transfused for pregnancy related causes. Specific knowledge about pregnancy related health problems which need blood transfusion were mentioned as follows: antepartum and postpartum hemorrhage (71.73%), anemia (56.29%), unsafe abortion (31.59%) and Caesarean section (29.45%). Around two third (60.33%) respondents knew that adequate access of blood could contribute for a significant reduction of maternal deaths in developing countries. Among the total respondents, 168 (39.9%) knew the correct volume of blood to be donated at once which is 350 or 450 ml per person . Among the total respondents, 177 (42.04%) knew the correct frequency of blood donation (three to four month). Generally, the overall knowledge assessment showed that 245 (58.19%) respondents had good knowledge about maternal health benefits of donated blood (Table 3).

Table 3- Knowledge about maternal health benefit of donated blood among AASTU regular undergraduate Students, Ethiopia, 2016 [n=421]

Variable	Frequency(n)	Percentage (%)
Pregnancy related health problems need blood		
Yes	344	81.71
No	77	18.29
Maternal health problems which need blood *		
Ante & post-partum hemorrhage	302	71.73
Anemia	237	56.29
Unsafe abortion	133	31.59
Caesarian section delivery	124	29.45
Blood Transfusion is component of obstetric care		
Yes	232	55.11
No	189	44.89
Adequate access of blood significantly reduces maternal deaths in developing countries		
Yes	254	60.33
No	167	39.67
Volume of blood to be donated at once per person		
350/450 ml	168	39.9
550 ml	31	7.36
750 ml	8	1.9
Don't know	214	50.83
Frequency of blood donation		
Every month	16	3.8
Every two month	19	4.51
Every three- four month	177	42.04
Every six month	44	10.45
Yearly	12	2.85
Don't know	153	36.34
Level of knowledge		
Poor	176	41.81 (95% CI: 37.07,46.54)
Good	245	58.19 (95% CI: 53.46,62.92)

*** = Multiple responses possible, percent can not add up to 100**

6.5 Attitude towards blood donation

Among the total respondents, 248 (58.9%) respondents strongly agreed that blood donation is a noble act, 114 (27.08%) strongly agreed that healthy individuals have a moral duty to donate blood, 137 (32.54%) disagreed that blood donation harms the donor's health, 191 (45.4%) strongly agreed that blood donor should always disclose correct information about his/her health condition & 147 (34.92%) agreed that they are willing to donate blood for unknown mother in emergency care. Generally, 221 (52.49%) of respondents had favorable attitude towards blood donation (Table 4).

Table 4- Attitude towards blood donation among Addis Ababa Science and Technology University regular undergraduate Students, Ethiopia, 2016 [n= 421]

Variable	Level of agreement				
	SD	**D**	**N**	**A**	**SA**
BD is a good & noble act	16 [3.8%]	9[2.14%]	6 [1.43%]	142 [33.73%]	248 [58.91%]
All healthy individuals have moral duty to donate blood	41 [9.74%]	48 [11.4%]	58 [13.78%]	160 [38%]	114 [27.08%]
BD harms the health of donor & makes susceptible to infection	91 [21.62%]	137 [32.54%]	77 [18.29%]	59 [14.01%]	57 [13.54%]
Blood donor should always disclose correct information about his/her health condition	15 [3.56%]	13 [3.09%]	21 [4.99%]	181 [42.99%]	191 [45.37%]
Willing to donate for unknown mother in emergency care	44 [10.45%]	48 [11.4%]	90 [21.38%]	147 [34.92%]	92 [21.85%]
VBD are the best source of blood	33 [7.84%]	39 [9.26%]	70 [16.63%]	183 [43.47%]	96[22.8%]
Blood donor should receive any benefit in exchange	120 [28.5%]	162 [38.48%]	57 [13.54%]	40 [9.5%]	42 [9.98%]
Blood bank sells blood to patients	140 [33.2%]	127 [30.2%]	89 [21.14%]	26 [6.18%]	39 [9.26%]
Level of attitude towards BD	Favorable attitude		221	52.49 (95%CI: 47.7,57.3)	
	Unfavorable attitude		200	47.51 (95%CI: 42.72,52.29)	

SD= strongly disagree, D= disagree, N= neutral, A= Agree, SA= strongly agree,

BD= blood donation, VBD= voluntary blood donation

6.6 PRACTICE OF BLOOD DONATION

The study showed that a quarter of the study participants (105, 24.94%) had donated blood at least one time voluntarily in the past. Out of those who donated blood,55 (52.38%) donated within the past one year and 35 (33.33%) donated between 1-2 years back. Among the blood donors, eighteen were regular blood donors. From the non-donors, 170 (53.8%) are willing to voluntarily donate blood in the future (Table 5).

Table 5- Practice of blood donation among Addis Ababa Science and Technology University regular undergraduate Students, Ethiopia, 2016

Variable	Frequency (n)	Percentage (%)
Ever donated blood (n=421)		
Yes	105	24.94 (95% CI: 20.79,29.09)
No	316	75.06 (95% CI: 70.91,79.21)
Recent blood donation time (n=105)		
Within 12 months	55	52.38
Between 12- 24 months	35	33.33
Before 24 months	15	14.29
Blood donation in the past 12 month for the first time (n=55)		
Yes	27	49.09
No	28	50.91
Blood donation duration before 12 month (n=27)		
Within 12 months	18	66.67
12-24 months	9	33.33
Non-donors intention to donate blood in the future (n=316)		
Yes	170	53.8
No	146	46.2

The study has shown that the most common motivating factor for blood donation among those who donated blood in the past was altruism/moral satisfaction (85, 80.95%) (Figure V).

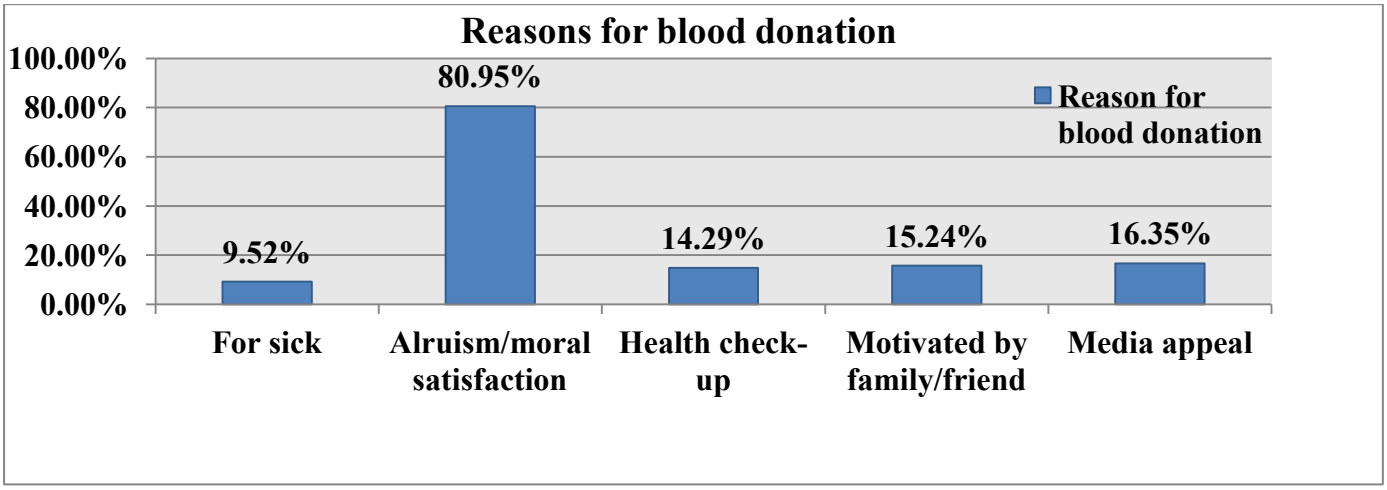

Figure III- Reason for practice of blood donation among AASTU regular undergraduate students, Ethiopia, 2016 [n= 105, Multiple responses possible, percent can't add up to 100]

Among the non-blood donors, the major reason for not donating blood were fear related to blood donation (195, 62.3%), never thought it (82, 25.95%) and lack of information (61, 19.3%) (Figure VI).

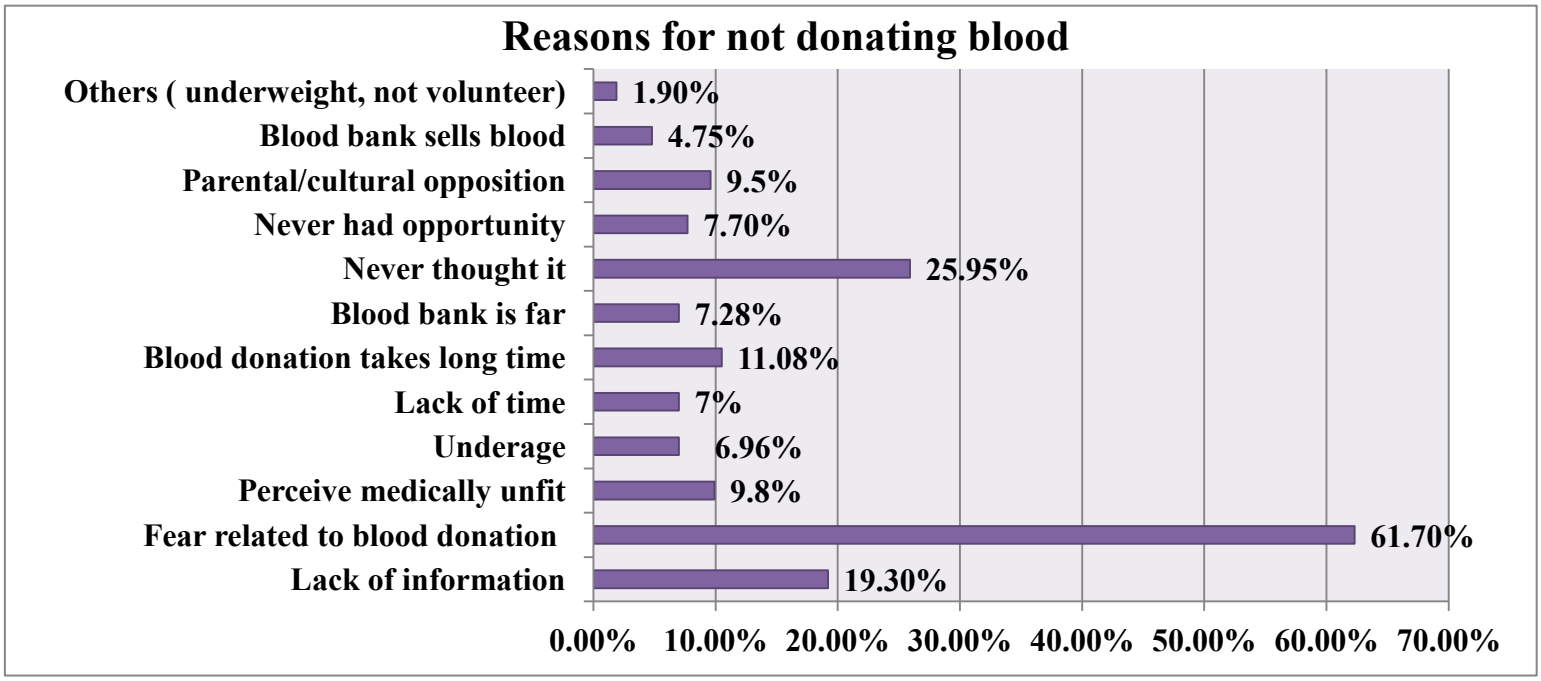

Figure IV- Reasons for not donating blood among AASTU regular undergraduate students, Ethiopia, 2016 [Multiple responses possible, percents can't add up to 100]

With regard to history of medical deferral, 25 (5.94%) respondents had been deferred from blood donation due to medical problem. All of the deferrals were for temporary period.

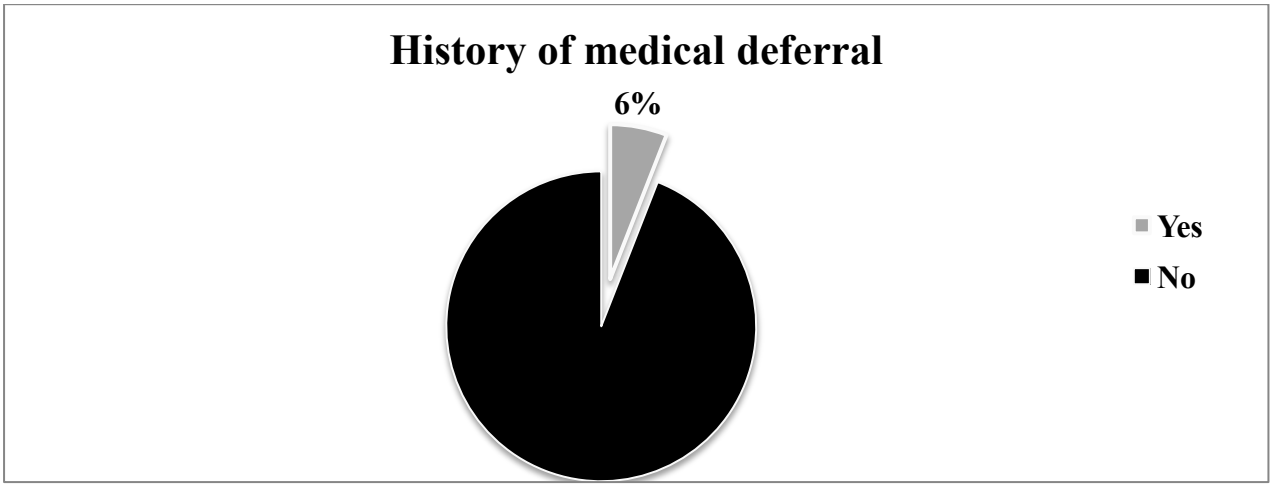

Figure V- History of medical deferral among AASTU regular undergraduate students, Ethiopia, 2016 [n= 421]

6.7 Access to blood donation center

Among the total respondents, 219(52%) didn't know the location of blood bank. Among those respondents who knew the location of blood bank, 90 (88.36%) said they can easily access blood donation center (within one hour). Majority (294, 69.8%) of the students believed that the service hour of blood bank is convenient. About one in five (82, 19.5%) study participants have participated in blood donation campaign.

6.8 Factors associated with history of blood donation

Among the variables; age, school, academic year, residence, family educational and economic status, knowledge about maternal health benefits of donated blood, attitude towards blood donation and family history of blood transfusion were found to have a significant association with practice of blood donation in a bivariate logistic regression analysis while school, family economic status, family history of blood transfusion, knowledge about maternal health benefits of donated blood and attitude towatds blood donation were significantly associated in multivariate logistic regression analysis.

In a bivariate logistic regression analysis, it was found that students with age group 20-24 years and 25 and above years were 2.39 **[COR, (95% CI), 2.39 (1.21, 4.73)]** & 2.99 **[COR, (95% CI), 2.99 (1.04, 8.59)]** times more likely to practice blood donation compared to students with age group 18-19 years, respectively. Students who came from urban areas were 3.74 **[COR, (95% CI), 3.74 (2.35, 5.96)]** times more likely to practice blood donation than students who came from rural areas. Students who are attending in the school of biological sciences were 2.13 **[COR, (95% CI), 2.13 (1.06, 4.28)]** times more likely to practice blood donation than engineering students. Students attending academic year of four and five were 2.74 **[COR, (95% CI), 2.74 (1.34, 5.6)]** and 3.32 **[COR, (95% CI), 3.32 (1.52, 7.25)]** times more likely to donate blood than academic year one students respectively. Students whose father and mother are educated (primary school and above) were 2.43 **[COR, (95% CI), 2.43 (1.42, 4.16)]** and 2.21**[COR, (95% CI), 2.21 (1.38, 3.55)]** times more likely to donate blood compared to students whose father and mother aren't educated respectively. Students from higher and medium family economic status were 3.84 **[COR, (95% CI), 3.84 (2.16, 6.85)]** and 1.89 **[COR, (95% CI), 1.89 (1.03, 3.47)]** times more likely to donate blood than those students who have families with low economic status, respectively. Study participants whose family had received blood transfusion are 3.35 times **[COR, (95% CI), 3.35 (2.04, 5.52)]** more likely to donate blood when compared to students whose family haven't received blood transfusion. Study participants' with good knowledge about maternal health benefits of donated blood are 6.84 times **[COR, (95%CI), 6.84 (3.74, 12.51)]** more likely to donate blood as compared to those who have poor knowledge. Study participants' with favorable attitude towards blood donation are 7.12 times **[COR, (95%CI), 7.12 (4.05, 12.53)]** more likely to donate blood as compared to those who have unfavorable attitude.

Using the multivariate logistic regression analysis, study participants attending in the school of biological sciences were 2.95 times **[AOR, (95% CI), 2.95 (1.16, 7.49)]** more likely to donate blood as compared to engineering students. Study participants from family with higher economic status were 2.85 times **[AOR, (95% CI), 2.85 (1.36, 5.97)]** more likely to donate blood as compared to students who had family with low economic status. Study participants whose family had received blood transfusion are 3.49times **[AOR, (95% CI), 3.49 (1.89, 6.45)]** more likely to donate blood when compared to students whose family haven't received blood transfusion. This study revealed that study participants' with good knowledge about maternal health benefits of donated blood are 3.94times **[AOR, (95%CI), 3.94 (1.97, 7.89)]** more likely to donate blood as compared to those who have poor knowledge. This study revealed that the study participants' with favorable attitude towards blood donation are 5.03 times **[AOR, (95%CI), 5.03 (2.63, 9.62)]** more likely to donate blood as compared to those who have unfavorable attitude. (See table 6)

Table 6 - Factors associated with blood donation among AASTU regular undergraduate students, Ethiopia, 2016.

Variable	Category	Ever donated blood		COR (95% CI)	AOR (95% CI)
		Yes	No		
Age	18-19 year	11 (10.48%)	70 (22.15%)	1	1
	20-24 year	86 (81.9%)	229 (72.47%)	2.39 (1.21,4.73)*	1.11 (0.4,3.1)
	≥25 year	8 (7.62%)	17 (5.38%)	2.99 (1.04,8.59)*	1.36 (0.3,6.2)
Sex	Male	60 (57.14%)	192(60.76%)	1	
	Female	45 (42.86%)	124 (39.24%)	1.16 (0.74,1.82)	
Residence	Urban	69 (65.71%)	107 (33.86%)	3.74 (2.35,5.96)*	1.51 (0.79,3.13)
	Rural	36 (34.29%)	209 (66.14%)	1	1
School	Engineering	90 (85.71%)	294 (93.04%)	1	1
	Bio sciences	15 (14.29%)	22 (6.96%)	2.13 (1.06,4.28)*	2.95 (1.16,7.49)*
Year of study	First	14 (13.33%)	82 (25.95%)	1	1
	Second	18 (17.14%)	57 (18.04%)	1.84 (0.85,4.01)	2.11 (0.73,6.11)
	Third	22 (20.95%)	76(24.05%)	1.69 (0.81,3.55)	1.46 (0.51,4.18)
	Fourth	30(28.57%)	64 (20.25%)	2.74 (1.34,5.6)*	2.13 (0.74,6.23)
	Fifth	21(20%)	37(10.71%)	3.32 (1.52,7.25)*	2.53 (0.76, 8.42)
Marital status	Single	99 (94.29%)	305(96.52%)	1	
	Married	6 (5.71%)	11 (3.48%)	1.68 (0.6,4.66)	
Father's education	Not educated	20 (19.05%)	115 (36.39%)	1	1
	Primary & above	85 (80.95%)	201 (63.61%)	2.43 (1.42,4.16)*	0.77 (0.3,1.97)
Mother's education	Not educated	31 (29.52%)	152 (48.1%)	1	1
	Primary & above	74(70.48%)	164 (51.9%)	2.21 (1.38,3.55)*	1.33 (0.54,2.75)
Family income	Low	21 (20%)	129 (40.82%)	1	1
	medium	32 (30.48%)	104 (32.91%)	1.89 (1.03,3.47)*	1.44 (0.69,2.97)
	High	52 (49.52%)	83 (26.27%)	3.84 (2.16,6.85)*	2.85 (1.36,5.97)*
Family Blood transfusion	Yes	40 (38.1%)	49 (15.51%)	3.35 (2.04,5.52)*	3.49 (1.89,6.45)*
	No	65 (60.19%)	267 (84.49%)	1	1
Family/peer donor	Yes	41 (39.05%)	96 (30.38%)	1.47 (0.93,2.32)	
	No	64 (60.95%)	220 (69.62%)	1	
Medical deferral	Yes	7 (6.67%)	18 (5.7%)	1.18 (0.48,2.91)	
	No	98 (93.33%)	298 (94.3%)	1	
Participate in campaign	Yes	32 (30.48%)	90 (28.48%)	1.1 (0.68,1.78)	
	No	73 (69.52%)	226 (71.52%)	1	
Knowing BB location	Yes	54 (51.43%)	135 (42.72%)	1.45 (0.91,2.21)	
	No	51 (48.57%)	181 (57.28%)	1	
Service convenience	Yes	66 (62.86%)	204 (64.56%)	0.93 (0.59,1.47)	
	No	39 (37.14%)	112 (35.44%)	1	
Access to BB	Easily	48 (88.89%)	119 (88.15%)	1.07 (0.39,2.91)	
	Difficult	6 (11.11%)	16 (11.85%)	1	
Knowledge on maternal benefit of BD	Good	91 (86.67%)	154 (48.73%)	6.84 (3.74,12.51)*	3.94 (1.97,7.89)*
	Poor	14 (13.33%)	162 (51.27%)	1	1
Attitude towards BD	Favorable	88 (83.81%)	133 (42.09%)	7.12 (4.05,12.53)*	5.03 (2.63,9.62)*
	Unfavorable	17 (16.19%)	183 (57.91%)	1	1

*** = Significant association at p value < 0.05**

BD= Blood donation

7. Discussion

The aim of the study was to assess the level of knowledge about maternal health benefits of donated blood, attitude and practice of blood donation and associated factors.

In this study, majority (89.55%) had awareness about blood donation. This is lower than study done in Nigeria where awareness about blood donation was 98.4% [20]. But it is higher than study in India & Botswana in which 79.5% & 85.2% of respondents were aware about blood donation, respectively [21, 23]. This might be due to difference in study group where study in India and Botswana was community based while the study in Nigeria was among married men. In the present study, the main sources of information about blood donation were School (63.4%), print media (48.5%), electronic media (58.4%) & health facities/ health professionals (39.8%). Similarly, in Botswana school (35.8%), health facilities (26.6%) & media (30.6%) were sources of information about blood donation [23].

In this study, knowledge about the need of blood for pregnancy related cases was 81.71% which is high when compared with a study done Nigeria where around two third (58.5%) of the respondents had the knowledge that blood transfusion may be required for pregnant women, in India where only 2.6% of respondents know pregnancy as an indication for blood donation & in Nigeria where 46.2% adults know of indication for blood transfusion was for child delivery [16, 21, 24]. This difference could be related to the information provided for the students while campaigning for blood donation to reduce the high maternal mortality in our country.

In this study, 58.19% of the participants have good knowledge about maternal health benefits of donated blood which is similar to a finding (60%) in a study conducted in Nigeria. In the current study, specific knowledge about pregnancy related health problems which need blood transfusion were mentioned as follows: unsafe abortion (31.59%), anemia (56.29%), Caesarean section (29.45%) and antepartum and postpartum hemorrhage (71.73%). This is lower than a study conducted in Nigeria where majority of respondents had good knowledge about pregnancy related conditions requiring blood transfusion like spontaneous abortion (44.0%), blood shortage (73.6%), Caesarean section (41.8%), antepartum and postpartum hemorrhage (81.4%). This difference could be due to the fact that the study in Nigeria was conducted among married men which may know better about pregnancy condition during antenatal care visit with their wives since their main source of information was health worker (51.6%) [20].

In this study, 52.49% of respondents have favorable attitude towards blood donation. This finding is lower than a study conducted in Lagos, south India & Addis Ababa University where 83%, 87.3% & 68% of the respondents had positive attitude towards blood donation respectively [22, 29, 32]. It was also lower than study done in Gulbarga, Kollam&Addis Ababa health facilitywhere 75.61%, 90% & 81.7% of respondents have a positive attitude towards blood donation respectively [27, 28, 33]. This difference could be from the fact that most of the studies in other places were conducted among medical students or health facility.

In this study, 56.77% of respondents were willing to donate blood for any unknown mother in emergencycare which is lower than the study done in Nigeria where 89.8% of respondents were willing to give donated blood for any pregnant women in need of it [20]. This difference could be due tostudy in Nigeria was among married men who may know better about blood donation during antenatal care visit with their wives.

In this study, the history of blood donation was 24.94%. This is similar to study done in Ambo University (23.6%) and Addia Ababa University (23.4%) [31, 32]. This could be due to more urbanized study area, access to blood bank service (periodic campaigns), easy access to information about blood donation and similiar level of attitude towards blood donation among the students.

The proportion of blood donation is higher than study conducted in Nigeria (15%) & south India (10.75%) [39, 48]. This variation could be as a result of study in Nigeria, the main reason among non-donors was lack of opportunity (45.4%), in India also 24.37% of non-donors don't know where to donate blood while in the current study lack of opportunity for non-donors was 7.7%. But, the proportion of practice of blood donation in the current study is lower than a study conducted in Botswana, Addis Ababa health facilities, Maryland, Brazil, Krishna hospital, Saudi Arabia, Cameroon, King Abdul-Aziz medical city, Benin, Kenya, Togo, Iran, Congo, Lagos and University of central India where history of blood donation was 27.1%, 32.6%, 59%, 32%, 49%, 53.3%, 39%, 55.6%, 41.4%, 41%, 31.6%, 37.9%, 54.9%, 35.5% & 47.5% respectively [23, 33-35, 37, 38, 40-47, 49]. This could be due to inaccessibility of blood bank service, low socio-economic status and misconception/ fear about blood donation in the current study. In Brazil, most (76.8%) respondents know relative who donates blood which means there is positive culture of blood donation in the community.

In this study, the proportion of regular donors was eighteen (4.27%). This is lower than study done in Botswana (9.6%) and Addis Ababa University (9.89%) and Addis Ababa Health Facilities (24.81%) & Benin Teaching Hospital (23.57%) [23, 32, 33, 42]. This difference is due to study participants in Benin and Addis Ababa have better awareness and attitude of blood donation since they are health professionals. Botswana is one of the five countries in Africa which have attained the minimum blood collection requirement. The study was community based in urban area where there may be easy access to blood donation center, positive behavior of blood donation since most of them (61.2%) know a friend/ family who donate blood and was strong predictor of blood donation[AOR (95% CI): 2.84 (1.58, 5.12)].

In this study, history of family/relative blood transfusion [AOR, (95% CI), 3.31 (1.8, 6.07)] was associated with practice of blood donation. Similarly, a study in Ambo University showed that students who have family who received blood from blood bank [AOR=2.24, 95%CI: 1.31-3.81] were associated with more tendencies to donate blood [31]. However, a study in Saudi Arabia indicates that history of blood transfusion was not associated with blood donation [38]. This might be due to the fact that family /relatives of patient undergo extensive health education by health professionals in health facility or blood bank which clear any misconception regarding blood donation and motivate them to blood donation.

In this study, level of attitude [AOR, (95%CI), 5.03 (2.63, 9.62)] was associated with practice of blood donation. This finding is also in agreement with a study done in Saudi Arabia, King Abdul-Aziz medical city, Kerman city & Sri Lakshmi Narayan Institute which showed that higher attitude was significant predictor of blood donation [38, 41, 50, 51].

In this study, good knowledge about maternal health benefit of donated blood [AOR, (95%CI), 3.94 (1.97,7.89)]was associated with practice of blood donation. In agreement with this, a study in Nigeria indicated that respondents with good knowledge of antenatal blood donation were willing to donate blood ($\chi 2$ =13.185; df =1; P = 0.0006) [20]. Though the latter study was on intention, those with high intention are more likely to practice blood donation in the future.

8. Conclusion

The study finding showed that knowledge about maternal health benefits of donated blood & attitude towards blood donation was low. The proportion of students who had ever donated bloodwasalso low compared to other countries; particularly the level of regular blood donorswas very low. Good knowledge about maternal health benefits of donated blood was associated with history of blood donation. Additionally, studying in school of biological science, coming from family with higher economic status, family history of blood transfusion and favorable attitude towards blood donation were also associated with blood donation.

9. Strength and limitation of the study

9.1 Strength of the study

- Study participants were selected using stratified sampling. This makes the study more representative by giving each stratum a proportional allocation.
- The interview method of data collection avoids the misunderstanding and ensures the data quality.

9.2 Limitation of the study

- Since the study is institution based, it may not give us the clear picture of community status of blood donation.

10. Recommendation

Based on the findings of the study, the following recommendations were made;

Programmers and policy makers

- Incorporate voluntary blood donation as an important health promotion intervention for maternal health.

National Blood Bnak Service

- Encourage, recruit and motivate potential youth donors from University in order to have a pool of eligible donors through periodic mobile sessions in University where the service isn't accessible and also expand the scope of the service where it isn't available.
- Work jointly with all stakeholders (Government institutions, NGO's, Community Based Organizations, Media and Private organizations) to create more awareness and sensitization about the need of blood for treating maternal health problems.

Addis Ababa Science and Technology University

- The University should strengthen blood donation clubs to organize different events to build students attitude positively and to increase the number of regular blood donors.

Researrchers

- More and more studies need to be conducted on this matter to identify more gaps and perhaps possible interventions accordingly, especially in community based setting with mixed method.

11. References

1. World Health Organization. Towards 100% Voluntary Blood Donation: A Global Framework for Action. Geneva: World Health Organization; 2010.Available from: http://www.who.int/bloodsafety/publications/9789241599696_eng.pdf.
2. United Nations. Trends in Maternal Mortality: 1990 to 2015. Estimates by WHO, UNICEF, UNFPA, World Bank Group &UNPD , November 2015.
3. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, Gülmezoglu AM, Temmerman M, Alkema L. Global Causes of Maternal Deaths: A WHO Systematic Analysis. Lancet Glob Health. 2014 Jun;2(6):e323-33.
4. World Health Organization (WHO) Essential Health Technologies, authors. Blood Transfusion Safety. Geneva: WHO; [Accessed July 14, 2015]. http://www.who.int/bloodsafety/en/Blood_Transfusion_Safety.pdf.
5. Cruz JR. Reduction of maternal mortality: the need for voluntary blood donors. Int J Gynecol Obstetr 2007; 98:291-3.
6. Joseph S, Roy N. Improving blood availability in peripheral health institutions, Rajasthan Health Sector Policy Reforms Options Database, Central Bureau of Health Intelligence, Ministry of Health and Family Welfare, Government of India; 2005. Available from: URL: http://www.cbhihsprod.nic.in/listdetails.asp?roid=222. [Accessed Aug 4, 2015].
7. The Hindu. Blood storage centers to reduce maternal mortality, 2007. (http://www.thehindu.com/2007/10/13/stories/2007101359870100.htm. [Accessed Aug 2, 2015].
8. WHO. Recommendations on Health Promotion Interventions for Maternal and Newborn Health. Geneva: World Health Organization; 2015. Available from: http://www.ncbi.nlm.nih.gov/books/NBK304983/.
9. WHO. ETHIOPIA UPDATE sheet on BLOOD safety, 2014 final in pdf. Available from: URL: http://www.afro.who.int/en/ethiopia/ethiopia-publications.html. [Accessed Aug 27, 2015].
10. World Health Organization. "Blood safety and availability," WHO Fact Sheet no. 279, World Health Organization, Reviewed June 2015.
11. Tapko, J. B., Toure, B., & Sambo, L. G. Status of Blood Safety in the WHO African Region: Report of the 2010 Survey. Brazzaville: WHO Regional Office for Africa, 2014.

12. The Federal Democratic Republic of Ethiopia, Ministry of Health. Health Sector Transformation Plan of Ethiopia (2015/16-2019/20), August 2015; page 42.
13. Berhan Y, Berhan A. Commentary: Reasons for Persistently High Maternal and Perinatal Mortalities in Ethiopia: Part III-Perspective of the "Three Delays" Model. Ethiopian Journal of Health Sciences. 2014; 24:137-148.
14. Bates I, Chapotera G, McKew S, van den Broek N. Maternal mortality in sub-Saharan Africa: the contribution of ineffective blood transfusion services. BJOG 2008; 115:1331–1339.
15. Tagny CT, Owusu-Ofori S, Mbanya D, Deneys V. The blood donor in sub-Saharan Africa: a review.Transfus Med. 2010 Feb;20(1):1-10.
16. Obi SN. Antenatal blood donation for pregnant Nigerian mothers: the husbands' perspective. J Obstet Gynaecol. 2007 Jul; 27(5):467-9.
17. S Isiaka-Lawal, HA Ameen, BS Okesina, RO Shittu, MA Sanni, MMB Uthman, OA Bolarinwa. Antenatal blood donation: Pregnant mothers' attitude, fears and preferences .Tropical Journal of Health Sciences 2014; Vol 21, No 2.
18. Lownik E, Riley E, Konstenius T, Riley W, McCullough J. Knowledge, attitudes and practices surveys of blood donation in developing countries. Vox Sang. 2012 Jul; 103(1):64-74.
19. Katherine E Kralievits, Nakul P Raykar, Sarah L M Greenberg, John G Meara. The global blood supply: a literature review. 27 April 2015,Volume 385, S28.
20. Ameen H A, Isiaka-Lawal S, Okesina B S, Shittu R O, Sanni M A, Uthman M, Bolarinwa O A. Willingness to support antenatal blood donation among married men in a Metropolitan City in North-central Nigeria. Niger Postgrad Med J 2015; 22:169-73.
21. Shidam UG, Lakshminarayanan S, Saurabh S, Roy G. Knowledge and Attitude Regarding Blood Donation in Rural Puducherry, India. Natl J Community Med 2015; 6(1):64-8.
22. OB Ogunbona, IP Okafor, AO Sekoni. Knowledge and practice of blood donation among University undergraduates. High Med Res J 2013; 13:26-30.
23. Pule Ishmael Pule, Boitshwarelo Rachaba, Mgaywa Gilbert Mjungu Damas Magafu, and Dereje Habte, "Factors Associated with Intention to Donate Blood: Sociodemographic and Past Experience Variables". Journal of Blood Transfusion 2014; Article ID 571678, 7 pages.

24. A.G. Salauden, O.I. Musa, A.O. AWOYEMI, A.O. Bolarinwa, A.O. Adegboye, S.O. Samuel. Community survey on blood donation practices in a northern state of Nigeria. J prev med hyg 2011; 52: 21-25
25. Amatya, M. Study on Knowledge, Attitude and Practice of Blood Donation among Students of Different Colleges of Kathmandu, Nepal. International Journal of Pharmaceutical and Biological Archives 2013; 4(3): 424-28.
26. Priyanka Maria Mathias, Nitin Yashas Murthy, Bestin Thomas, Nagotu Anush, Ashwini GS, Deepthi Shanbhag.Knowledge, Attitude and Practice of Blood Donation among adults in a rural population in Karnataka, India .International Journal of Advanced Research 2014, Volume 2, Issue 8, 430-437.
27. HASHMI, Gulrukh; G, Boramma; KAPATE, Rajashekhar. Knowledge, Attitude and Practice Regarding Blood Donation in Medical Undergraduates: A Cross Sectional Study. Innovative Journal of Medical and Health Science, [S.l.], v. 4, n. 4, p. 128-130, jul.2014. ISSN 2277-4939.
28. Ahmad Nadeem Aslami, Abraham Jobby, Sony Simon, Nahla Nazarudeen, Pranav Raj, Mohammed Ramees, Nikhila Harigopal, Nishani N. "Assessment of Knowledge, Attitude and Practice (KAP) of Blood Donation among MBBS Students of a Medical College in Kollam, Kerala". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 35, April 30; Page: 6086-6095.
29. Sabu KM, Remya A, Binu VS, Vivek R. Knowledge, Attitude and Practice on Blood Donation among Health Science Students in a University campus, South India. Online J Health Allied Scs. 2011;10(2):6.
30. Ahmed Z, Zafar M, Khan AA, Anjum MU, Siddique MA. Knowledge, Attitude and Practices about Blood Donation among Undergraduate Medical Students in Karachi. J Infect Dis Ther, 2014; 2:134. doi: 10.4172/2332-0877.1000134.
31. Nigatu A, Demissie DB. Knowledge, Attitude and Practice on Voluntary Blood Donation and Associated Factors among Ambo University Regular Students, Ambo Town, Ethiopia. J Community Med Health Educ, 2014; 4: 315. doi:10.4172/2161-0711.1000315.
32. Misganaw C, Tenkir M, Deresea A, Tesfaye M, Hawult T. The level and associated factors of knowledge, attitude and practice of blood donation among health science students of Addis Ababa University. International Journal of Medical and Health Sciences Research, 2014; 1(10): 105-118.

33. Bantayehu D. Knowledge, Attitude, and Practice of Voluntary Blood Donation and Associated Factors among Health Care Providers in Addis Ababa health Facilities, Ethiopia. Occup Med Health Aff, 2015; vol 3: 209. doi:10.4172/2329-6879.1000209.
34. Boulware LE, Ratner LE, Ness PM, Cooper LA, Campbell-Lee S, LaVeist TA, Powe NR. The contribution of socio demographic, medical, and attitudinal factors to blood donation among the general public.Transfusion. 2002 Jun; 42(6):669-78.
35. Zago A., Silveira M.F., Dumith C.S. Blood donation prevalence and associated factors in Pelotas, Southern Brazil. Rev Saudi Publica. 2010 Feb; 44(1):112-120.
36. Devi H Sanayaima, Jalina Shantibala K, Elangbam Laishram Vijay. Knowledge, Attitude and Practice (KAP) of Blood Safety and Donation. Indian Medical Gazette. 2012 Jan; 145 (1): 1-5.
37. Hiremath P. To Assess the Knowledge of Blood Donation among Voluntary Blood Donor at Blood Bank, Krishna Hospital Karad (Maharashtra, India). J Nurs Care, 2012; 1:124. doi:10.4172/2167-1168.1000124.
38. Abolfotouh MA, Al-Assiri MH, Al-Omani M, Al Johar A, Al Hakbani A, Alaskar AS. Public awareness of blood donation in Central Saudi Arabia. International Journal of General Medicine, 2014; 7:401-410. doi:10.2147/IJGM.S67187.
39. Salaudeen A G, Odeh E. Knowledge and behavior towards voluntary blood donation among students of a tertiary institution in Nigeria. Niger J Clin Pract 2011;14:303-7.
40. Sigurd Christoffer Rolseth, Pål Sverre Stange. Attitudes to blood donation in Ngaoundéré, Cameroon; Student thesis [unpublished]. Faculty of Medicine, University of Oslo, 2012.
41. Najd Alfouzan. "Knowledge, Attitudes, and Motivations towards Blood Donation among King Abdulaziz Medical City Population," International Journal of Family Medicine, 2014; Article ID 539670, 8 pages. doi:10.1155/2014/539670.
42. Benedict N, Usimenahon A, Alexander NI, Isi A. Knowledge, attitude and practice of voluntary blood donation among physicians in a tertiary health facility of a developing country. International Journal of Blood Transfusion and Immunohematology 2012; 2:4-10.
43. Njambi Njuguna. Factors influencing blood donation at selected sites in Nairobi. JKUAT Abstracts Post-Graduate Thesis [unpublished], 2012.
44. Agbovi KK, Kolou M, Fétéké L, Haudrechy D, North ML, Ségbéna AY. Knowledge, attitudes and practices about blood donation. A sociological study among the population of Lomé, Togo. Transfus Clin Biol. 2006 Oct; 13(4):260-5.

45. Javadzadeh SH, Yavari MT, Attar M, Ahmadiyeh MH. Knowledge, attitude and practice study about blood donation in the urban population of Yazd, Iran, 2004. Transfus Med 2006; 1: 403-9.
46. Kabinda, J., Miyanga, S., Ramazani, S. and Dramaix, M. Assessment of Knowledge, Attitude and Practice of the General Population of Bukavu in the Democratic Republic of Congo on Blood Donation and Blood Transfusion. Health Oct 2014;Vol 6, No 18: 2525-2534. doi: 10.4236/health.2014.618291.
47. Udegbe A, Odukoya O O, Ogunnowo B E. Knowledge, attitude, and practice of voluntary blood donation among residents in a rural local government area in Lagos state: A mixed methods survey. Niger J Health Sci 2015;15:80-8.
48. S. Manikandan, R. Srikumar, P. N. Ruvanthika. A Study on Knowledge, Attitude and Practice on Blood Donation among Health Professional Students in Chennai, Tamil Nadu, South India. International Journal of Scientific and Research Publications. March 2013; Volume 3, Issue 3, ISSN 2250-3153.
49. Giri PA, Phalke DB. Knowledge and Attitude about Blood Donation Amongst Undergraduate Students of Pravara Institute of Medical Sciences Deemed University of Central India. Ann Trop Med Public Health 2012;5:569-73.
50. Baig M, Habib H, H. Haji A, T. Alsharief F, M. Noor A, G. Makki R. Knowledge, Misconceptions and Motivations towards Blood Donation among University Students in KSA. Pakistan Journal of Medical Sciences. 2013; 29(6):1295-1299.
51. V. Kowsalya, R. Vijayakumar, R. Chidambaram, R. Srikumar, E. Prabhakar Reddy, S. Latha, I. Gayathri Fathima and C. Kishor Kumar. A Study on Knowledge, Attitude and Practice Regarding Voluntary Blood Donation among Medical Students in Puducherry, India. Pak J Biol Sci 2013 May; 16(9):439-42.

12. Annex

12.1Sample size calculation procedure

Table 7- Showing sample size calculation for variables.

Study area	Study objective	Proportion	Sample size
Ambo University	Attitude towards blood donation	47.4%	421
	Practice of blood donation	23.6%	305
Addis Ababa University	Attitude towards blood donation	68%	368
	Practice of blood donation	23.4%	303
Nigeria	Knowledge about antenatal blood donation	60%	406
Nigeria	Knowledge about indication of blood transfusion for child delivery	46.2%	420
Nigeria	knowledge that blood transfusion may be required for pregnant women	58.5%	410
University of Central India	Practice of blood donation	47.5%	421

Table 8- Showing the number of students in each department with year of study

The proportional formula for each batch is:= $\frac{nfxn}{N}$ nf= final sample size

n=total students in each strata

N=total number of students

School	Department	Total	1st	2nd	3rd	4th	5th
Information Science & Technology n= 1154, S=72	Software engineering	99	54	45	-	-	-
	Electronics & electrical engineering	648	84	69	224	174	97
	Computer engineering	224	45	37	71	28	43
	Computer sc. & info. technology	183	46	38	72	27	-
Chemical & Material Sc. & Techno. n= 548, S=34	Chemical engineering	384	71	59	80	88	86
	Food processing engineering	164	50	41	26	29	18
Architecture & Urban Design n=430, S=27	Architecture	271	61	50	57	60	43
	Urban planning and design	159	21	17	31	43	47
Energy Resources & Env'tal Eng. n= 543, S=34	Environmental engineering	241	69	57	28	49	38
	Water & sanitary engineering	302	80	66	51	59	46
Mechanical & manufacturing Eng. n=1034, S=64	Electromechanical engineering	513	79	65	124	166	79
	Mechanical engineering	250	81	67	102	-	-
	Manufacturing engineering	271	65	54	54	54	44
Earth Science & Eng. n=377, S=23	Mining engineering	161	42	35	34	26	24
	Earth science	216	76	63	33	44	-
Civil Eng. & COTM n=1872, S=116	Civil engineering	1076	143	116	283	308	226
	COTM	796	137	113	205	199	142
Bio & Chemical Sc. & Techno. n=814, S=51	Bio-technology	218	81	68	39	30	-
	Eco-biology	174	60	50	25	39	-
	Food science & applied nutrition	194	73	60	31	30	-
	Industrial chemistry	228	82	68	36	42	-

12.2 Schematic illustration of sampling procedure

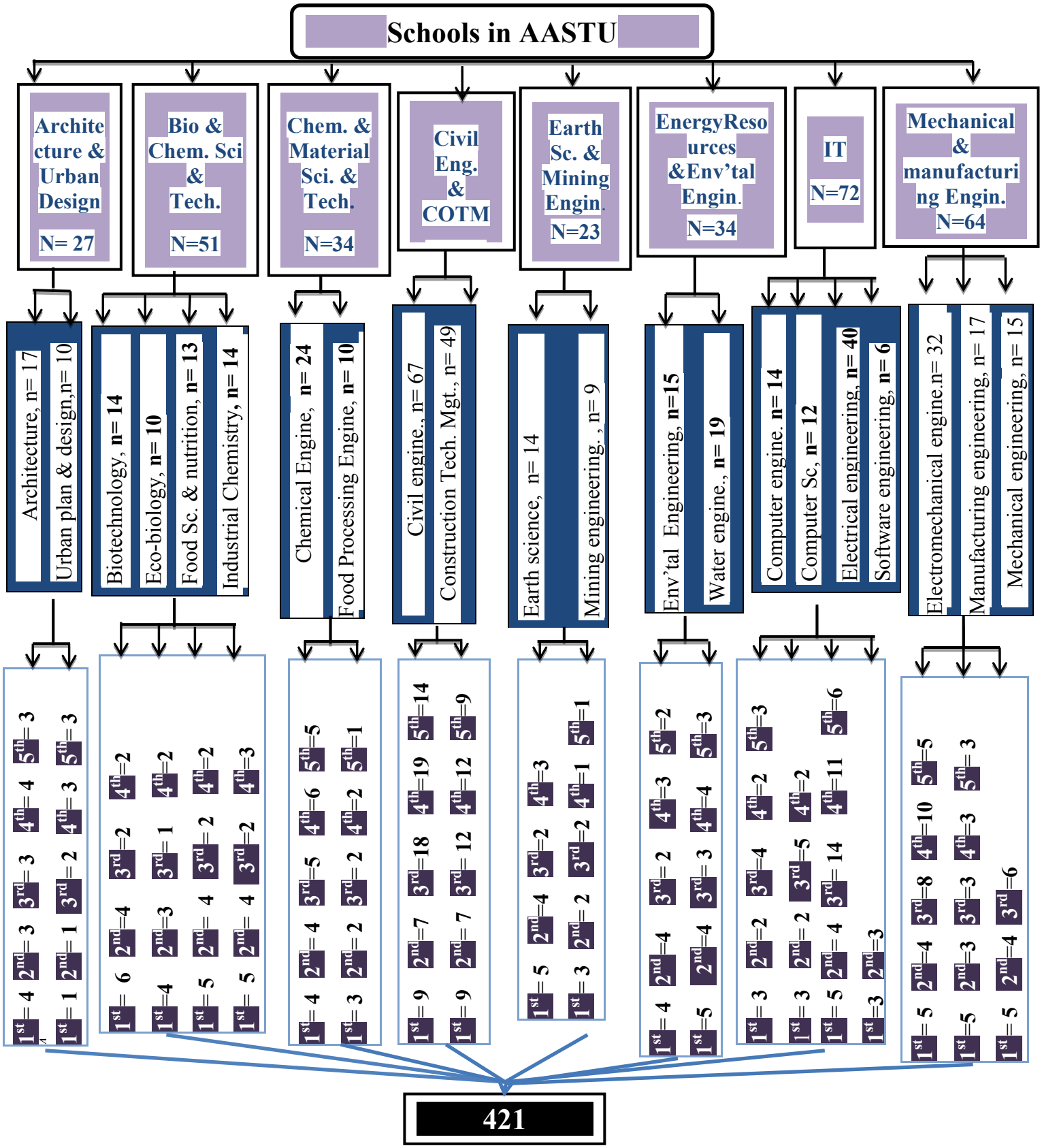

Figure VI- Schematic presentation of sampling technique

12.3 English version questionnaire

A questionnaire designed to gather information on regard to the level of knowledgeabout maternal health benefit of donated blood, attitude and practice of blood donation and associated factors in Addis Ababa Science & Technology University students.

INFORMATION SHEET

INTRODUCTION

I ……. am assigned as data collector on behalf of Amanuel H/Selassie, who is a post graduate student at Addis Ababa University, School of Public Health.The aim of the study is to assess the knowledge of maternal health benefit of donated blood, attitude and practice of blood donation and associated factors using face to face interview.

You are selected randomly & your participation in the study is completely voluntarilybased. You can decide not to participate in the study or you can interrupt the study at any time during the interview. If you participate in the study, the information you give helps us to understand the current situation of knowledge about maternal health benefit of donated blood, attitude and practice of blood donationso that it serves as input for policy makers and programmers planning and designinginterventions to improve problems. The interview takes about 20-30 minutes. Your name will not be written in the questionnaire and I assure you that all information you give will be kept strictly confidential.

Please contact the principal investigator for any further explanation through the address below: **AMANUEL H/SELASSIE – 09 14 73 21 00 / amanuel0914732100@gmail.com**

WritenConsent

Are willing to participate in the study? Yes ☐ No ☐

If "yes", would you put your signature?

I, the undersigned, am clear about the objectives of the study and I have decided to participate in the study.

Participant's signature……....

Interviewer's name& Signature……

Data collection supervisor name & Signature …….

Date of interview …….

Questionnaire ID number…….

No.	Question	Response (Options)	Remark
PART I- SOCIO-DEMOGRAPHIC CHARACTERSTICS			
101	How old were you at your last birthday?	[__ __] completed years	
102	What is your sex?	1.Male ☐ 2. Female ☐	
103	What is department are you attending now?	.....	
104	What class year are you attending?	.....	
105	What is your marital status?	1.Single ☐ 2.Married ☐ 3.Separated ☐ 4.Widowed ☐ 5.Divorced ☐	
106	What is your religion?	1. Orthodox ☐ 2. Muslim ☐ 3. Protestant ☐ 4. Catholic ☐ 5. Others (specify)……..	
107	What is your ethnicity?	1. Amara ☐ 2.Oromo ☐ 3. Tigre ☐ 4.Gurage ☐ 5. Wolayta ☐ 6. Sidama ☐ 7. Other specify.....	
108	What was your previous area of residence?	1. Urban ☐ 2. Rural ☐	
109	Have your father ever attended school?	1 .Yes ☐ 2. No ☐	If "yes", skip to Q. 110
110	If "Yes" to Q. 109, What is the highest level of school your father attended?	1. Primary ☐ 2. Secondary ☐ 3. Technical/Vocational ☐ 4.Higher (College/University) ☐	
111	Have your father ever attended school?	1 .Yes ☐ 2. No ☐	If "yes", skip to Q. 112
112	If "Yes" to Q. 111, What is the highest level of school your mother attended?	1. Primary ☐ 2. Secondary ☐ 3. Technical/Vocational ☐ 4. Higher (College/University) ☐	
113	What is monthly income of your family in birr?	……. Ethiopian birr	

Part II- Situational/contextual factors (History of past blood donation and transfusion)			
No.	**Question**	**Response (Options)**	**Remark**
201	Have your family members or relatives been transfused with blood in the past?	1.Yes ☐ 2. No ☐	If Yes, Skip to Q.202
202	If your answer to Q. no.201 is "yes", for what case was blood needed? (**More than one answer is possible**.)	1. Maternal cases ☐ 2. Child illness ☐ 3. Medical ☐ 4. Surgery ☐ 5. Accident ☐ 6.Hematological/Cancer☐	
203	Do you have any friend or relative or family member who donates blood?	1.Yes ☐ 2. No ☐	

PART III- KNOWLEDGE ABOUT MATERNAL BENEFIT OF BLOOD DONATION			
No.	**Question**	**Response (Options)**	**Remark**
301	Have you heard or seen about blood donation?	1.Yes ☐ 2. No ☐	If Yes, skip to Q. 302
302	If your answer to Q. no. 301 is "yes", from where did you hear or see those messages? (**More than one answer is possible**.)	1.Health professionals/facility ☐ 2. Print media (Newspaper, leaflet, brusher, billboard) ☐ 3. Electronic media (TV, Radio) ☐ 4. School/University ☐ 5. Friends/ Family, relatives ☐ 6. Religious worship place ☐	
303	Is donated blood transfused Pregnancy-related problems ?	1.Yes ☐ 2. No ☐	If " Yes", skip to Q. 304
	If your answer to Q.no 303 is " Yes", what conditions need blood?		
304	Ante & post-partum hemorrhage	Yes ☐ No ☐	
305	Anemia	Yes ☐ No ☐	
306	Unsafe abortion	Yes ☐ No ☐	
307	Caesarian section delivery	Yes ☐ No ☐	
308	Is blood transfusion an essential component of comprehensive emergency obstetric care?	1. Yes ☐ 2. No☐	

309	A significant number of maternal deaths in developing countries could be avoided through adequate access of blood?	1. Yes ☐ 2. No ☐	
310	What volume of blood is collected from a blood donor individual at a time?	1. 350 ml ☐ 2. 450 ml ☐ 3. 550 ml ☐ 4. 750ml☐ 5. I don't know ☐	
311	How often can an individual donate blood?	1. Weekly ☐ 2. Monthly ☐ 3. Every 2 month ☐ 4. Every 3-4 month ☐ 5. Every 6 month ☐ 6. Yearly ☐ 7. I don't know ☐	

PART IV- ATTITUDE ABOUT BLOOD DONATION

No.	**Question**	**Level of agreement**				
	Score for Level of agreement- **1(SD)**-Strongly Disagree**2(D)**-Disagree**3(N)**-Neutral **4(A)**- Agree **5(SA)**-Strongly Agree **Please**- Answer by making a tick mark inside the box.	**1** **SD**	**2** **D**	**3** **N**	**4** **A**	**5** **SA**
401	Do you think that blood donation is a good and noble act?					
402	All healthy individuals have moral duty to donate blood?					
403	Blood donation harms the health of donor and makes him/her susceptible to contracting infection?					
404	Blood donor should always disclose correct information about his/her health before donating blood?					
405	Are you willing with donating blood for any unknown mother in emergency care in need of blood?					
406	Voluntary blood donors are the best source of blood?					
407	Blood donor should receive any benefit in exchange?					
408	Do you think that blood is sold by blood bank to patients?					

PART V- PRACTICE ABOUT BLOOD DONATION

No.	**Question**	**Response (Options)**	**Remark**
501	Have you ever donated blood before?	1.Yes ☐ 2. No ☐	If yes, skip toQ. 502,504. If no, skip toQ.503,507

502	If your answer to Q. no.501 is "yes", what prompted you? (**More than one answer is possible.)**	1. A sick person needed ☐ 2. Moral satisfaction, altruism ☐ 3.Earning profit in cash / kind ☐ 4. For free health checkup ☐ 5. Motivated by friend /family donor ☐ 6.Media appeal ☐	
503	If your answer to Q. no.501 is "no", what was the reason? (**More than one answer is possible**.)	1. I have no information ☐ 2. Fear of blood donation ☐ 3. Medically unfit ☐ 4. Under age ☐ 5. Cultural or religious rejection ☐ 6. Lack of time ☐ 7. It takes long time ☐ 8. Inaccessibility of the service ☐ 9. Never thought of it ☐ 10. Parental or peer opposition ☐ 11. Never had the opportunity ☐ 12. My blood will be sold ☐ 13. Others specify……	
504	If your answer to Q. no.501 is "yes", when was your recent donation from the time of survey?	1. Within the last12months ☐ 2. Within the last 12-24 months ☐ 3. Before the last 24 months ☐	If "within the last 12 months", skip to Q. 505
505	If your answer to Q. no 504 is "within the last 12 months", was it your first donation?	1.Yes ☐ 2. No ☐	If "No", skip to Q. 506
506	If your answer to Q. no 505 is "no", when last did you donate before your recent donation?	1. Within 12 months ☐ 2. Within 12-24 months ☐	
507	If you have not ever donated blood before, are you willing to donate blood in the future?	1. Yes ☐ 2. No ☐	

Part VI- Medical related factors			
No.	**Question**	**Response/Options**	**Remark**
601	Have you ever been deferred from donating blood due to medical problem after being screened?	1.Yes ☐ 2. No ☐	If "yes", Skip to Q.602
602	If your answer to Q no.601 is "yes", for how long was it?	1. Temporarily ☐ 2. Permanently ☐	

Part VII- Service access related issues			
No.	**Question**	**Response/Options**	**Remark**
701	Do you know where blood bank is located in your previous and current residence?	1. Yes ☐ 2. No ☐	If 'yes', Skip to Q.702.
702	If your answer to Q. 701 is yes, how long does it take you to reach the blood donation center using vehicle transport?	1. < 30 minutes☐2. ½- 1 hour ☐ 3. 1-2 hour ☐4. ≥2 hours ☐	
703	Did the service hours of the blood bank fit with your schedule?	1. Yes ☐ 2. No ☐	
704	Have you ever participated in organizingblood donation campaign with blood bank?	1.Yes ☐ 2. No ☐	

12.4 Amharic version questionnaire

በአማርኛ የተዘጋጀ መጠይቅ

ይህ መጠይቅ የተዘጋጀዉ የአ/አ ሳይንስና ቴክኖሎጂ ዩኒቨርሲቲ ተማሪዎች የደምልገሳ ለእናቶች ጤና ባለዉ ጥቅም ያላቸዉ እዉቀት፣ የደምልገሳ አመለካከታቸዉና ልምዳቸዉ ላይ ያተኮረ መረጃ ለመሰብሰብ የተዘጋጀ ነዉ።

<u>መግቢያ</u>

እኔ .....የ አ/አ ዩኒቨርሲቲ የሕብረተሰብ ጤና ት/ት ክፍልተማሪ በሆነዉ አማኑኤል ሃ/ስላሴ የተዘጋጀ መጠይቅ መርጃ ለመሰብበስ የተወከልኩ ነኝ። የዚህ ጥናት ዋና ዓላማ ደም ለእናቶች ጤና ባለዉ ጥቅም ያለዉ የእዉቀት ደረጃ፣ የደም-ልገሳ አመለካከታትና ልምድ ሁኔታና ተያያዥ ነገሮች ላይ ያተኮረ መረጃ ለመሰብሰብ ነዉ። የአንተ/ቺ በዚህ ጥናት ላይ መሳተፍ በዘፈቀደ የተመረጠ ሲሆን ግን ያንተ/ቺን ሙሉፈቃደኝነት የሚጠይቅ ነዉ።በጥናቱ ለመሳተፍ ከተስማማህ/ሽ በጎላ መሃል ላይ ትተህ/ሽ የመዉጣት ሙሉ መብት አለህ/ሽ። ሆኖም ግን ያንተ/ቺ በዚህ ጥናት መሳተፍ የደም-ልገሳ ለእናቶች ጤና ባለዉ ጥቅም ዙርያ ያለዉ እዉቀት፣ የደም-ልገሳ አመለካከታቸዉና ተግባር ነባራዊ ሁኔታ ለመረዳት ከማገዙም በላይ ተያያዥ ችግሮችን ለመፍታት ዕቅዶችን፣ ፕሮግራሞችና ፓሊሲዎች ለመቅረፅ ይረዳል።ይህን ቃለ-መጠይቅ ለመጨረስ የሚፈጀዉ ጊዜ በአማካኝ ከ 20-30 ደቂቃ ይሆናል።ስምህ/ሽ በመጠይቁ ላይ አይጠቀስም፤ እንዲሁም የምትሞላ/ዪዉ መረጃ በሚስጥርነት ይጠበቃል፡ከጥናቱ ዉጪ ለሌላ ዓላማ አይዉልም።

ለ በለጠ መረጃ የጥናት ቡድኑ ዋና መሪ ከዚህ በታች በተጠቀሰዉ አድራሻ ማግኘት ይችላሉ።

አማኑኤል ሃ/ስላሴ- 09 14 73 21 00 / amanuel0914732100@gmail.com

የስምምነት መሙያ ቅፅ

በዚህ ጥናት ለመሳተፍ ፈቃደኛ ነህ/ሽ ? አዎ ☐ አይደለሁም ☐

መልስህ/ሽ "አዎ" ከሆነ መስማማትህ/ሽን በፊርማህ/ሽ ብታረጋግጥ/ጪ?

እኔ የፈረምኩት ግለሰብ የጥናቱ ዋና ዓላማ ገብቶኝ በመጠይቁ ለመሳተፍ መስማማቴን በፊርማዬ አረጋግጣለሁ።

የተጠያቂ ፊርማ .....

የጠያቂ ስምና ፊርማ .....

የሱፐርቫይዘር ስምና ፊርማ.....

መጠይቅ የተሞላበት ቀን .....

የመጠይቅ ቅፅ መለያ ቁጥር .....

ክፍል 1- ማሕበራዊና ስነ-ሕዝባዊ ሁኔታ በተመለከተ			
ተ.ቁ	ጥያቄ	አማራጭ	ሽግግር
101	እድሜህ/ሽ ስንት ነዉ?	..... አመት	
102	ፆታ	1. ወንድ ☐ 2. ሴት ☐	
103	የትምህርት ዘርፍህ/ሽ	.....	
104	የጥናት አመትህ/ሽ	.....	
105	የጋብቻ ሁኔታ ምን ይመስላል?	1. ያላገባ ☐ 2. ያገባ ☐ 3. ተለያይቶ የሚኖር ☐ 4. ባል/ሚስት የሞተበ/ባት ☐ 5. የፈታ ☐	
106	የምን ሃይማኖት ተከታይ ነህ/ሽ?	1. ኦርቶዶክስ ☐ 2. ሙስሊም ☐ 3.ፕሮቴስታንት ☐ 4. ካቶሊክ ☐ 5. ሌላ ካል ይግለፁ.....	
107	ብሔርህ/ሽ ምንድነዉ?	1. አማራ ☐ 2. ኦሮሞ ☐ 3. ትግሬ☐ 4. ጉራጌ ☐ 5. ወላይታ ☐ 6. ሲዳማ ☐ 7. ሌላ ካለይግለፁ.....	
108	ወደ ዩኒቨርሲቲ ሳትገባ/ቢ በፊት የት ትኖር ነበር?	1. ከተማ ☐ 2. ገጠር ☐	
109	አባትህ/ሽ መደበኛ ትምህርት ተምረው ያውቃሉ?	1. አዎ ☐ 2. አይደለም ☐	“አዎ” ካሉ ወደጥያቄ ቁጥር 110 ይሻገሩ።
110	ለ ጥያቄ ቁ. 109፤ መልሰዎ አዎ ከሆነ የአባትህ/ሽ የትምህርት ደረጃ ምን ያህል ድረስ ነዉ?	1. አንደኛ ደረጃ (1 - 8 ክፍል) ☐ 2. ሁለተኛ ደረጃ (9 - 12 ክፍል) ☐ 3. ቴክሊክና ሙያ ☐ 4. ከፍተኛ ደረጃ (ኮሌጅ/ ዩኒቨርሲቲ) ☐	
111	እናትህ/ሽ መደበኛ ትምህርት ተምረው ያውቃሉ?	1. አዎ ☐ 2. አይደለም ☐	“አዎ” ካሉ ወደ ጥያቄ ቁጥር 112 ይሻገሩ።
112	የእናትህ/ሽ የትምህርት ደረጃ ምን ያህል ድረስ ነዉ?	1. አንደኛ ደረጃ (1 - 8 ክፍል ☐ 2. ሁለተኛ ደረጃ (9 - 12 ክፍል) ☐ 3. ቴክሊክና ሙያ ☐ 4. ከፍተኛ ደረጃ (ኮሌጅ/ ዩኒቨርሲቲ) ☐	
113	የቤተሰብህ/ሽወርሃዊገቢበገንዘብ ሲተመን ምን ያህላል?	..... የኢትዮጵያ ብር	

ክፍል 2- የደም ልገሳ ና ቅበላ ታሪክ በተመለከተ			
ተ.ቁ	ጥያቄ	አማራጭ	ሽግግር
201	ከቤተሰብ አባል ወይም ከቅርብ ዘመድ መሃል ለሕክምና ደም ወስዶ የሚያዉቅ ሰዉ አለ?	1. አዎ ☐ 2. አይደለም ☐	“አዎ” ካሉ ወደ ጥያቄ ቁ.202 ይሻገሩ።

202	ለጥያቄ ቁጥር 201 መልስዎ “አዎ” ከሆነ፤ በምን ጤና ችግር ምክንያት ነበር ደም ያስፈለገዉ? (ከአንድ በላይ መልስ መስጠት ይቻላል)	1. የእርግዝና/ ወሊድ ችግር ☐ 2. ለህፃን ህመም ☐ 3. የዉስጥ ደዌ ☐ 4. ለቀዶ ጥገና ☐ 5. የተሸከርካሪ አደጋ ☐ 6. የደም ስርአት ችግር (ካንሰር) ☐	
203	ደም የሚለግስ ቤተሰብ ወይም ዘመድ ወይም ጉዋደኛ አለህ/ሽ?	1. አዎ ☐ 2. አይደለም ☐	
ክፍል 3- የደም ልገሳ ጥቅም በተመለከተ የሚዳስስ የእዉቀት ጥያቄ			
ተ.ቁ	ጥያቄ	አማራጭ	ሽግግር
301	ከዚህ በፊት ስለደም ልገሳ መልእክት ሰምተህ/ሽ ወይም አይተህ/ሽ ታዉቃለህ/ሽ?	1. አዎ ☐ 2. አይደለም ☐	“አዎ” ካሉ ወደ ጥያቄ ቁጥር 302 ይሻገሩ።
302	ለጥያቄ ቁጥር 301 መልስዎ “አዎ” ከሆነ፤ መልዕክቱን ከየት ነበር ያገኘህ/ሽዉ? (ከአንድ በላይ መልስ መስጠት ይቻላል)	1. ከጤና ማዕከል/ ጤና ባለሙያ ☐ 2. ከሕትመት ሚድያ(መፅሄት፣ በራሪ ወረቀት፣ቢል ቦርድ) ☐ 3. ከኤሌክተሮኒክ ሚድያ (ቴሌቪዥን፣ሬድዮ) ☐ 4. ትምህርት ቤት ☐ 5. ከቤተሰብ/ዘመድ/ጎደኛ ☐ 6. የሃይማኖት አምልኮ ቦታ ☐	
303	የሚለገሰዉ ደም ከእርግዝና/ወሊድ ጋር ለተያያዙ ችግሮች የሕክምና አገልግሎት ይዉላል?	1. አዎ ☐ 2. አይደለም ☐	አዎ” ካሉ ወደ ጥያቄ ቁጥር 304 ይሻገሩ።
ለጥ.ቁ 303 መልስዎ አዎ” ከሆነ፤ የደም ልገሳ የሚያስፈልጋቸዉ የጤና ችግሮች የትኞቹ ናቸዉ?			
304 305 306 307	በወሊድ ጊዜ የሚያጋጥም ደም መፍሰስ ደም ማነስ ጥንቃቄ የጎደለዉ ፅንስ ማስወረድ በቀዶ ጥገና ልጅ ለመዉለድ	አዎ ☐ አይደለም ☐ አዎ ☐ አይደለም ☐ አዎ ☐ አይደለም ☐ አዎ ☐ አይደለም ☐	
308	ለ ወሊድ ጤና እንክብካቤ ከሚያስፈልጉ የህክምና አገልግሎቶች መሃል አንዱ የደም ቅበላነዉ?	1. አዎ ☐ 2. አይደለም ☐	
309	በማደግ ላይ ባለት አገሮች የእናቶች ሞት ቁጥርን በበቂ የደምአቅርቦት አማካይነት በወሳኝ መጠን መቀነስ ይቻላል?	1. አዎ ☐ 2. አይደለም ☐	
310	ከደም ሊጋሽ የሚወሰደዉ ደም መጠኑ በሚሊሊትር ምን ያህል ይሆናል?	1. 350 ☐ 2. 450 ☐ 3. 550 ☐ 4. 750 ☐ 5. አላዉቅም ☐	
311	አንድ ሰዉ በምን ያህል የጊዜ ገደብ ዉስጥ ደም መለገስ ይችላል?	1. በየሳምንቱ ☐ 2. በየወሩ ☐ 3. በየሁለት ወሩ ☐ 4. በየ3-4 ወሩ ☐ 5. በየ6 ወሩ ☐ 6. በየዓመቱ ☐ 7. አላዉቅም ☐	

ክፍል 4- የደም ልገሳ አመለካከት

የስምምነት ደረጃ- 1- በጣም አልስማማም 2- አልስማማም 3- መወሰን አልችልም 4- እስማማለሁ 5- በጣም እስማማለሁ::

ማሳሰብያ- መልሱን በሳጥኑ ዉስጥ የ “ይሆናል” ምልክት (☑) በማድረግ ይሞላ::

ተ.ቁ	ጥያቄ	አማራጭ				
		1	2	3	4	5
401	የደም ልገሳ በጎና ሰብአዊ ተግባር ነዉ::					
402	ማንኛዉም ጤነኛ ግለሰብ ደም የመለገስ የህሊና ግዴታ አለበት::					
403	ደም ሊጋሹ ደም በመለገሱ ምክንያት ለጤና ችግር ይዳረጋል::					
404	ደም ሊጋሽ በምርመራ ጊዜ ስለጤንነቱ ሁልጊዜ ትክክለኛ መረጃ መስጠት አለበት::					
405	ደም ለሚያስፈልጋት ለየትኛዋም እናት ደም ለመስጠት ፈቃደኛ ነህ?					
406	የበጎ ፈቃድ ደም ሊጋሾች የአስተማማኝ ደም አቅርቦት ምንጭ ናቸዉ::					
407	ደም ሊጋሽ ላከናወነዉ የደም ልገሳ በአይነት/በክፍያ ጥቅም ማግኘት አለበት::					
408	ደም ባንክ ለታካሚዎች የሚያቀርበዉ የደም ከረጢት በሽያጭ ነዉ ነዉ::					

ክፍል 5- የደም ልገሳ ተግባር/ልምድ

ተ.ቁ	ጥያቄ	አማራጭ	ሽግግር
501	ከዚህ በፊት ደም ለግሰህ/ሽ ታዉቃለህ/ሽ?	1. አዎ ☐ 2. አይደለም ☐	“አዎ” ካሉ ወደ ጥ.ቁ. 502 ፣504 ይሻገሩ:: “አይደለም” ካሉ ወደ ጥ.ቁ. 503፣ 507 ይሻገሩ::
502	ለጥያቄ ቁጥር 501 መልስዎ “አዎ” ከሆነ፤ ደም ለመለገስ ያለሳሳህ/ሽ ምክንያት ምን ነበር? (ከአንድ በላይ መልስ መስጠት ይቻላል)	1. የታመመ ስዉስላስፈለገዉ ☐ 2. የህሊና እርካታ ለማግኘት ☐ 3. ጥቅም ለማግኘት ☐ 4. የጤና ምርመራ ለማድረግ ☐ 5. ደም ሊጋሽ ቤተሰብ/ጉዋደኛ ቀስቅሶኝ ☐ 6. የሚድያ ጥሪ ሰምቼ ☐	
503	ለጥያቄ ቁጥር 501 መልስዎ “አይደለም” ከሆነ፤ ምክንያትህ/ሽ ምንድነዉ? (ከአንድ በላይ መልስ መስጠት ይቻላል)	1. እዉቀቱ ስለሌለኝ ☐ 2 ፈርቼ ☐ 3. የጤና ችግር ስላለብኝ ☐ 4. እድሜዬ ስላልደረሰ ☐ 5. ባህሌ/ሃይማኖቴ ስለማይቀበለዉ ☐ 6. ጊዜ ስለሌለኝ ☐ 7. ደም ልገሳ ብዙ ሰዓት ስለሚፈጅ ☐ 8. የደም ልገሳ ማዕከል ስለሚርቅ ☐ 9. አስቤበት አላዉቅም ☐ 10. ቤተሰቤ/ጉዋደኛዬ ስለማይደግፉት ☐ 11. እድሉ ስላላገኘሁ ☐ 12. ደም ባንክ “ደሜን ይሸጣል” ብዬ ስለማስብ ☐ 13. ሌላ ካለ ይግለፁ.....	

504	ለጥያቄ ቁጥር 501 መልስዎ “አዎ” ከሆነ፤ በቅርብ ደም የለገስክበት ጊዜ ከዛሬ ቀን ወደኃላ ሲቆጠር ምን ያህል ይሆናል?	1. በ 12 ወራት ዉስጥ ☐ 2. ከ 12-24 ወራት ዉስጥ ☐ 3. ከ 24 ወራት በፊት ☐	“በ 12 ወራት ዉስጥ” ካሉ፤ ወደ ጥያቄ ቁ. 505 ይሻገሩ።
505	ለጥያቄ ቁጥር 504 መልስዎ ““በ 12 ወራት ዉስጥ” ከሆነ፤ በዛን ወቀት የለገስከዉ ለመጀመርያ ጊዜ ነበር?	1. አዎ ☐ 2. አይደለም ☐	“አይደለም” ካሉ ወደ ጥያቄ ቁ. 506 ይሻገሩ።
506	ለጥያቄ ቁጥር 505 መልስዎ “አይደለም” ከሆነ፤ በቅርብ ና ከዛ በፊት በለገስከዉ ያለዉ የጊዜ ልዩነት ምን ያህል ይሆናል?	1. በ 12 ወራት ዉስጥ ☐ 2. ከ 12-24 ወራት ☐	
507	ከዚህ በፊት ደም ካልለገስክ/ሽ፤ ለወደፊት ደም ለመለገስ ፈቃደኛ ነህ/ሽ?	1. አዎ ☐ 2. አይደለሁም ☐	

ክፍል 6- የጤና ጉዳዮች የተመለከተ

ተ.ቁ	ጥያቄ	አማራጭ	ሽግግር
601	ደም ለመለገስ ቀርበህ/ሽ በጤና ችግር ምክንያት ሳትለግስ/ሺ ተመልሰህ/ሽ ታዉቃለህ/ቂያለሽ?	1. አዎ ☐ 2. አይደለም ☐	“አዎ” ካሉ ወደ ጥያቄ ቁ. 602 ይሻገሩ።
602	ለጥያቄ ቁጥር 601 መልስዎ “አዎ” ከሆነ፤ ለምን ያህል ጊዜ ነበር ደም መለገስ አትችልም/ዪም የተባልከዉ/ሽዉ?	1. በጊዚያዊነት ☐ 2. በቀዋሚነት ☐	

ክፍል 7- ከአገልገሎት ተደራሽነት(ተጠቃሚነት) ጋር የተያያዙ ሁኔታዎች

ተ.ቁ	ጥያቄ	አማራጭ	ሽግግር
701	የደም ባንክ በአቅራብያ በምትኖር/ሪበት ወይም በምትማር/ሪበት ቦታ የት እንደሚገኝ ታዉቃለህ/ቂያለሽ?	1. አዎ ☐ 2. አይደለም ☐	“አዎ” ካሉ ወደ ጥ.ቁ. 702 ይሻገሩ።
702	ለጥያቄ ቁጥር 701 መልስዎ “አዎ” ከሆነ፤ በመኪና ትራንስፖርት ምን ያህል ጊዜ ይወስዳል?	1. ከ30 ደቂቃ በታች ☐ 2. 30-60 ደቂቃ ☐ 3. 1-2 ሰዓት ☐ 4. ≥ 2 ሰዓት ☐	
703	የደም ልገሳ አገልግሎት መስጫ ሰዓት ይመችሃል?	1. አዎ ☐ 2. አይደለም ☐	
704	በደም ባንክ የተዘጋጀ የቅስቀሳ ዘመቻ ላይ ተሳትፈህ ታዉቃለህ/ቂያለሽ?	1. አዎ ☐ 2. አይደለም ☐	